New York State

DEC

# Water Quality Regulations

## Surface Water and Groundwater Classifications and Standards New York State Codes, Rules and Regulations Title 6, Chapter X Parts 700-706

**Includes Amendments Through August 4, 1999**

**New York State Department of Environmental Conservation**

George E. Pataki, *Governor*

John P. Cahill, *Commissioner*

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Title 06
Conservation
Vol. A-4



Printed in the United States of America
by
West Group
610 Opperman Drive
P.O. Box 64526
St. Paul, MN 55164-0526

# FOREWARD

This booklet was prepared by the New York State Department of Environmental Conservation (NYSDEC) to distribute the portion of water quality regulations concerning water quality standards and classifications. Presented here are the complete copies of Parts 700 – 706, as published in the *Official Compilation of Codes, Rules and Regulations of the State of New York* (NYCRR). These regulations include amendments that became effective on August 4, 1999, and corrections by NYSDEC to several typographical errors.

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# ARTICLE 2

## *Classifications and Standards of Quality and Purity*



# PART 700

## DEFINITIONS, SAMPLES AND TESTS

(Statutory authority: Environmental Conservation Law, §§ 3-0301[2][m], 15-0313, 17-0301, 17-0303, 17-0809)



**Historical Note**

Part repealed, new (§§ 700.1-700.2) filed: April 28, 1972; Feb. 25, 1974; repealed, new (§§ 700.1-700.4) filed Aug. 2, 1991 eff. 30 days after filing.

### § 700.1 Definitions.

(a) The terms, words, or phrases used in Parts 700-705 of this Title shall have the meanings described below.

(1) *Acute toxic effect* means an effect that usually occurs shortly after the administration of either a single dose or multiple doses of a chemical.

(2) *Administrator* means the Administrator of the United States Environmental Protection Agency.

(3) *Approved treatment* as applied to water supplies means treatment accepted as satisfactory by the authorities responsible for exercising supervision over the quality of water supplies.

(4) *Best usages* as specified for each class of water means those uses as determined by the commissioner in accordance with the considerations prescribed by the Environmental Conservation Law.

(5) *Chronic toxic effect* means an effect that is irreversible or progressive or occurs because the rate of injury is greater than the rate of repair during prolonged exposure to a chemical.

(6) *Coastal waters* mean those marine waters within the territorial limits of the State other than estuaries and enclosed bays. Long Island Sound is designated as coastal waters for the purposes of thermal discharges.

(7) *Commissioner* means the Commissioner of the Department of Environmental Conservation.

(8) *Consolidated rock or bedrock* means the compact or solid hard rock beneath or exposed at the surface of the earth or overlain by surface waters.

(9) *Department* means the New York State Department of Environmental Conservation.

(10) *Disposal system* means a system for disposing of sewage, industrial waste or other wastes, including sewer systems and treatment works.

(11) *Effluent limitations* mean any restriction on quantities, qualities, rates and concentrations of chemical, physical, biological, and other constituents of effluents that are discharged into or allowed to run from an outlet or point source or any other discharge within the meaning of section 17-0501 of the Environmental Conservation Law into surface waters, groundwater or unsaturated zones.

(12) *Enclosed bays* mean those marine waters within the territorial limits of New York State, other than coastal waters or estuaries, in which exchange of sea water is severely limited by barrier beaches. For the purpose of thermal discharges, the following are designated as enclosed bays: Jamaica Bay, Hempstead Bay, Great South Bay, Moriches Bay, Shinnecock Bay and Mecox Bay.

(13) *Estuary* means the tidal portion of a river or stream.

(14) *Fresh groundwaters* mean those groundwaters having a chloride concentration equal to or less than 250 mg/L or a total dissolved solids concentration equal to or less than 1,000 mg/L.

(15) *Great Lakes System* means classified segments identified in Part 805; Parts 835 through 839; Parts 845 through 848; Parts 820 and 821; Parts 895 through 899; and Items 1a, 1b and 441 through 1661 of Part 910 of this Title.

(16) *Groundwaters* mean those waters in saturated zones.

(17) *Groundwater effluent limitations* mean those effluent limitations that have been adopted in section 703.6 or developed in accordance with section 702.16(c) of this Title for protection of groundwater.

(18) *Guidance value* means such measure of purity or quality for any waters in relation to their reasonable and necessary use as may be established by the department pursuant to sections 702.1 and 702.15 of this Title.

(19) *Heat of artificial origin* means all heat from other than natural sources, including but not limited to cumulative effects of multiple and proximate thermal discharges.

(20) *Industrial waste* means any liquid, gaseous, solid or waste substance, or a combination thereof, resulting from any process of industry, manufacturing, trade, or business or from the development or recovery of any natural resources, that may cause or might reasonably be expected to cause pollution of the waters of the State in contravention of the standards adopted pursuant to the Environmental Conservation Law, article 17.

(21) *Land application techniques* include the following three basic methods of waste discharge application: irrigation, infiltration-percolation, and overland flow.

(22) *Land utilization practices* entail the use of plants, the soil surface, and soil matrix for removal of certain wastewater constituents.

(23) *Micrograms per liter (ug/L)* means the weight in micrograms of any specific substance or substances contained in one liter of liquid.

(24) *Milligrams per liter (mg/L)* means the weight in milligrams of any specific substance or substances contained in one liter of liquid.

(25) *New York/New Jersey harbor* means saltwater classified segments identified in Part 859; Part 864; Part 890, except Item 1 and its tributaries; Part 891; and Items 1, 2 and 3 and their tributaries of Part 935 of this Title.

(26) *Oncogenic effect* means the induction of tumors that has been demonstrated in:

(i) humans;

(ii) two mammalian species;

(iii) one mammalian species, independently reproduced;

(iv) one mammalian species, to an unusual degree with respect to incidence, latency period, site, tumor type or age at onset;

(v) one mammalian species, supported by positive results in short-term tests that are indicative of potential oncogenic activity; or

(vi) one mammalian species, supported by positive results for another substance for which similar oncogenic effects are anticipated because of similarity of functional groups or metabolic or toxicologic pathways.

(27) *Other wastes* means garbage, refuse, decayed wood, sawdust, shavings, bark, sand, lime, cinders, ashes, offal, oil, tar, dyestuffs, acids, chemicals, leachate, sludge, salt and all other discarded matter not sewage or industrial waste that may cause or might reasonably be expected to cause pollution of the waters of the State in contravention of the standards adopted pursuant to the Environmental Conservation Law, article 17.

(28) *Outlet* means the terminus of a sewer system, or the point of emergence of any water-borne sewage, industrial waste or other wastes or the effluent therefrom, into the waters of the State.

(29) *Pathogenic organism* means any disease-producing organism.

(30) *Person or persons* means any individual, public or private corporation, political subdivision, government agency, municipality, industry, co-partnership, association, firm, trust, estate or any other legal entity whatsoever.

(31) *Point source* means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel or other floating craft from which pollutants are or may be discharged.

(32) *Pollutant* means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, and industrial, municipal, and agricultural waste discharged into water.

(33) *Pollution* means the presence in the environment of conditions and/or contaminants in quantities of characteristics that are or may be injurious to human, plant or animal life or to property or that unreasonably interfere with the comfortable enjoyment of life and property throughout such areas of the State as shall be affected thereby.

(34) *Potable waters* mean those fresh waters usable for drinking, culinary or food processing purposes.

(35) *Primary contact recreation* means recreational activities where the human body may come in direct contact with raw water to the point of complete body submergence. Primary contact recreation includes, but is not limited to, swimming, diving, water skiing, skin diving and surfing.

(36) *Principal organic contaminant classes* means the classes of organic chemicals listed below.

(i) Halogenated alkane: compound containing carbon (C), hydrogen (H) and halogen (X) where X = fluorine (F), chlorine (Cl), bromine (Br) and/or iodine (I), having the general formula $C_nH_yX_z$, where $y + z = 2n + 2$; n, y and z are integer variables; n and z are equal to or greater than one and y is equal to or greater than zero. Specifically excluded from this class are chloroform, bromoform, bromodichloromethane and dibromochloromethane.

(ii) Halogenated ether: compound containing carbon (C), hydrogen (H), oxygen (O) and halogen (X) (where X = F, Cl, Br and/or I) having the general formula $C_nH_yX_zO$, where $y + z = 2n + 2$; the oxygen is bonded to two carbons; n, y and z are integer variables; n is equal to or greater than two, y is equal to or greater than zero and z is equal to or greater than one.

(iii) Halobenzenes and substituted halobenzenes: derivatives of benzene which have at least one halogen atom attached to the ring and which may or may not have straight or branched chain hydrocarbon, nitrogen or oxygen substituents.

(iv) Benzene and alkyl- or nitrogen-substituted benzenes: benzene or a derivative of benzene which has either an alkyl- and/or a nitrogen-substituent.

(v) Substituted, unsaturated hydrocarbons: a straight or branched chain unsaturated hydrocarbon compound containing one of the following: halogen, aldehyde, nitrile or amide.

(vi) Halogenated nonaromatic cyclic hydrocarbons: a nonaromatic cyclic compound containing a halogen.

(37) *Saline groundwater* means groundwater having a chloride concentration of more than 250 mg/L or a total dissolved solids concentration of more than 1,000 mg/L.

(38) *Saline surface waters* mean all waters that are so designated by the commissioner.

(39) *Saturated zones* means any extensive portion of the earth's crust that contains sufficient water to fill all interconnected voids or pore spaces.

(40) *Secondary contact recreation* means recreational activities where contact with the water is minimal and where ingestion of the water is not probable. Secondary contact recreation includes, but is not limited to, fishing and boating.

(41) *Sewage* means the water-carried human or animal wastes from residences, buildings, industrial establishments or other places, together with such groundwater infiltration and surface water as may be present.

(42) *Source of water supply for drinking, culinary or food processing purposes* means any water source, either public or private, that is used for domestic consumption or used in connection with the processing of milk, beverages or food.

(43) *Specific MCL* means a maximum contaminant level (MCL) included in 10 NYCRR 5-1.51, 5-1.52 or 5-1.55 for either an individual substance or group of substances. A Specific MCL does not include the 10 NYCRR Part 5 MCLs for principal organic contaminants or unspecified organic contaminants.

(44) *Standards* mean such measures of purity or quality for any waters in relation to their reasonable and necessary use as may be established by the department pursuant to section 17-0301 of the Environmental Conservation Law.

(45) *Subsurface sewage disposal system* means a disposal system that discharges sewage beneath the surface of the ground.

(46) *Thermal discharge* means a discharge that results or would result in a temperature change of the receiving water.

(47) *Toxic pollutant* means those pollutants, or combination of pollutants, including disease-causing agents, that after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly through food chains, will, on the basis of information available to the department, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, including malfunctions in reproduction, or physical deformations, in such organisms or their offspring.

(48) *Treatment works* means any plant, disposal field, lagoon, pumping station, constructed drainage ditch or surface water intercepting ditch, incinerator, area devoted to sanitary landfills or other works not specifically mentioned here, installed for the purpose of treating, neutralizing, stabilizing or disposing of sewage, industrial waste or other wastes.

(49) *Unconsolidated deposits* means all non- or poorly indurated soil materials above the bedrock.

(50) *Waste management system* includes the management of mechanical equipment, crops, irrigation and monitors as an operational unit.

(51) *Water quality-based effluent limitations* means effluent limitations for surface waters that are derived from water quality standards or guidance values.

**Historical Note**

Sec. repealed, new filed: April 28, 1972; Feb. 25, 1974; Aug. 2, 1991; amds. filed: Feb. 10, 1998; July 16, 1999 eff. Aug. 4, 1999. Amended (a)(15).

## § 700.2 Collection of samples.

(a) The determination of compliance or noncompliance of sewage, industrial waste or other waste discharges with the requirements of Parts 700 through 705 of this Title shall be made through analytical methods or tests of groundwater, surface water or effluent samples collected in such manner as approved by the department.

(b) In selecting or approving the locations at which such samples are collected, the department shall consider all relevant factors, including but not limited to subdivisions (c) through (e) of this section.

(c) For groundwater samples:

(1) the mobility of pollutants in unsaturated zones, which, among other things, is affected by the rate of movement of percolating water; and

(2) attenuation of pollutants that may occur in passage through unsaturated and saturated zones.

(d) For surface water samples:

(1) there must be prompt mixing of the discharge with the receiving waters;

(2) mixing shall not interfere with biological communities to a degree that is damaging to the ecosystem;

(3) the zone of mixing shall not include intakes for potable water supplies; and

(4) mixing shall not diminish other beneficial uses disproportionately.

(e) The location at which effluent samples are collected shall be at a point where the effluent emerges from a treatment works, disposal system, outlet or point source, and prior to being discharged to surface water or the ground, unless specified otherwise by a State Pollutant Discharge Elimination System (SPDES) permit issued pursuant to Parts 750-758 of this Title.

**Historical Note**

Sec. repealed, new filed: April 28, 1972; Feb. 25, 1974; amd. filed Nov. 5, 1984; repealed, new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing. Amended (b).

## § 700.3 Tests or analytical methods.

(a) Tests or analytical methods for measurement of surface water or groundwater to determine compliance with standards or guidance values shall be made in accordance with the following requirements:

(1) 40 CFR part 136, as of July 1, 1988 (see section 705.1 of this Title); or

(2) other tests or analytical methods approved by the department.

(b) Tests or analytical methods to determine compliance with effluent limitations shall be made in accordance with subdivision (a) of this section, unless a different test or analytical method is specified in a State Pollutant Discharge Elimination System permit.

**Historical Note**

Sec. filed Aug. 2, 1991 eff. 30 days after filing.

## § 700.4 Severability.

If any provision of this Part or its application to any person or circumstance is held to be invalid, the remainder of this Part and the application of that provision to other persons or circumstances will not be affected.

**Historical Note**

Sec. filed Aug. 2, 1991 eff. 30 days after filing.

# PART 701

## CLASSIFICATIONS—SURFACE WATERS AND GROUNDWATERS

(Statutory authority: Environmental Conservation Law, §§ 1-0101, 3-0301[2][m], 15-0313, 17-0101, 17-0301, 17-0303, 17-0809)



**Historical Note**

Part repealed, new filed: April 28, 1972; Feb. 25, 1974; repealed new (§§ 701.1-701.19) filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.1 General conditions applying to all water classifications.

The discharge of sewage, industrial waste or other wastes shall not cause impairment of the best usages of the receiving water as specified by the water classifications at the location of discharge and at other locations that may be affected by such discharge.

**Historical Note**

Sec. repealed, new filed April 28, 1972; amds. filed: Nov. 5, 1984; July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

## FRESH SURFACE WATERS

### § 701.2 Class N fresh surface waters.

(a) The best usages of Class N waters are the enjoyment of water in its natural condition and, where compatible, as a source of water for drinking or culinary purposes, bathing, fishing, fish propagation, and recreation.

(b) There shall be no discharge of sewage, industrial wastes, or other wastes, waste effluents or any sewage effluents not having had filtration resulting from at least 200 feet of lateral travel through unconsolidated earth. A greater distance may be required if inspection shows that, due to peculiar geologic conditions, this distance is inadequate to protect the water from pollution.

(c) These waters shall contain no deleterious substances, hydrocarbons or substances that would contribute to eutrophication, nor shall they receive surface runoff containing any such substance.

**Historical Note**

Sec. repealed, new filed: April 28, 1972; Feb. 25, 1974; amd. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

## § 701.3 Class AA-Special (AA-S) fresh surface waters.

(a) The best usages of Class AA-S waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival.

(b) These waters shall contain no floating solids, settleable solids, oil, sludge deposits, toxic wastes, deleterious substances, colored or other wastes or heated liquids attributable to sewage, industrial wastes or other wastes.

(c) There shall be no discharge or disposal of sewage, industrial wastes or other wastes into these waters.

(d) These waters shall contain no phosphorus and nitrogen in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.

**Historical Note**

Sec. amd. filed May 26, 1967; repealed, new filed: April 28, 1972; Feb. 25, 1974; renum. 701.18, new filed July 3 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

## § 701.4 Class A-Special (A-S) fresh surface waters.

(a) The best usages of Class A-S waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival.

(b) This classification may be given to those international boundary waters that, if subjected to approved treatment, equal to coagulation, sedimentation, filtration and disinfection with additional treatment, if necessary, to reduce naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.

**Historical Note**

Sec. repealed, new filed: April 28, 1972; Feb. 25, 1974; amd. filed Sept. 20, 1974; renum. 701.19, new filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

## § 701.5 Class AA fresh surface waters.

(a) The best usages of Class AA waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival.

(b) This classification may be given to those waters that, if subjected to approved disinfection treatment, with additional treatment if necessary to remove naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.

**Historical Note**

Sec. repealed, filed March 20, 1967; new filed Feb. 25, 1974; amd. filed Sept. 20, 1974; renum. 701.20, new filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.6 Class A fresh surface waters.

(a) The best usages of Class A waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival.

(b) This classification may be given to those waters that, if subjected to approved treatment equal to coagulation, sedimentation, filtration and disinfection, with additional treatment if necessary to reduce naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.7 Class B fresh surface waters.

The best usages of Class B waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.8 Class C fresh surface waters.

The best usage of Class C waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.9 Class D fresh surface waters.

The best usage of Class D waters is fishing. Due to such natural conditions as intermittency of flow, water conditions not conducive to propagation of game fishery, or stream bed conditions, the waters will not support fish propagation. These waters shall be suitable for fish survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

## SALINE SURFACE WATERS

### § 701.10 Class SA saline surface waters.

The best usages of Class SA waters are shellfishing for market purposes, primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.11 Class SB saline surface waters.

The best usages of Class SB waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.12 Class SC saline surface waters.

The best usage of Class SC waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.13 Class I saline surface waters.

The best usages of Class I waters are secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.14 Class SD saline surface waters.

The best usage of Class SD waters is fishing. These waters shall be suitable for fish survival. This classification may be given to those waters that, because of natural or man-made conditions, cannot meet the requirements for primary and secondary contact recreation and fish propagation.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

## GROUNDWATERS

### § 701.15 Class GA fresh groundwaters.

The best usage of Class GA waters is as a source of potable water supply. Class GA waters are fresh groundwaters.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.16 Class GSA saline groundwaters.

The best usages of Class GSA waters are as a source of potable mineral waters, or conversion to fresh potable waters, or as raw material for the manufacture of sodium chloride or its derivatives or similar products. Class GSA waters are saline groundwaters.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.17 Class GSB saline groundwaters.

The best usage of Class GSB waters is as a receiving water for disposal of wastes. Class GSB waters are saline groundwaters that have a chloride concentration in excess of 1,000 milligrams per liter or a total dissolved solids concentration in excess of 2,000 milligrams per liter.

**Historical Note**

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

### § 701.18 Assignment of groundwater classifications.

(a) The groundwater classifications defined in sections 701.15 and 701.16 of this Part are assigned to all the groundwaters of New York State.

(b) The Class GSB shall not be assigned to any groundwaters of the State, unless the commissioner finds that adjacent and tributary groundwaters and the best usages thereof will not be impaired by such classification.

**Historical Note**

Sec. added by renum. 701.3, filed July 3, 1985; repealed, new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing. Amended (a).

## DISCHARGE RESTRICTION CATEGORIES

### § 701.19 Discharge restriction categories.

Discharge restriction categories may be assigned to surface waters or groundwaters by the department. When used, the discharge restriction category will be applied to such classified waters along with the applicable best usage and other existing standards.

**Historical Note**

Sec. added by renum. and amd. 701.4, filed July 3, 1985; amd. filed Sept. 20, 1985; repealed, new filed Aug. 2, 1991; renum. 701.25, new filed Sept. 7, 1993 eff. 30 days after filing.

### § 701.20 Purpose.

(a) The discharge restriction categories may be assigned to:

(1) waters of particular public health concern;

(2) significant recreational or ecological waters where the quality of the water is critical to maintaining the value for which the waters are distinguished; and

(3) other sensitive waters where the department has determined that existing standards are not adequate to maintain water quality.

(b) Waters of particular public health concern may include:

(1) waters within a 60-day water time-of-travel of unfiltered public water supply intake points;

(2) public water supply watersheds with reservoirs experiencing accelerated eutrophication;

(3) groundwaters requiring such protection as specified in watershed rules and regulations or wellhead protection programs; and

(4) marine waters certified by the department for taking of shellfish.

(c) Significant recreational and ecological waters may include:

(1) wild and scenic rivers designated as per ECL 15-2701 and Part 666 of this Title;

(2) critical aquatic habitat for fishes, amphibians, or aquatic invertebrates listed as endangered, threatened, or of special concern in Part 182 of this Title;

(3) State park waters;

(4) State and Federal wildlife management area waters;

(5) groundwaters and surface waters tributary to and within freshwater wetlands designated class I pursuant to Part 664 of this Title;

(6) classified waters within intertidal marsh and coastal fresh marsh tidal wetlands designated as per Part 661 of this Title;

(7) waters protected under the *Constitution* of the State; and

(8) pristine, minimally impacted waters with a diversity of naturally reproducing aquatic species.

(d) Other sensitive waters may include:

(1) recreational waters where accelerated eutrophication threatens current and future use of the waters;

(2) waters where physical accumulation or bioaccumulation of contaminants produce water use impairments;

(3) small trout spawning streams; and

(4) waters with little assimilative capacity due to natural background conditions or human activities.

**Historical Note**

Sec. added by renum. 701.5, filed July 3, 1985; amd. filed Sept. 20, 1985; repealed, filed Aug. 2, 1991; new filed Sept. 7, 1993 eff. 30 days after filing.

## § 701.21 Criteria.

(a) In assigning discharge restriction categories, the department will consider factors including the size of the waterbody, the nature of the surrounding district including the watershed, and the uses and quality of the waters. The department will also weigh the need for the additional water quality protection of the discharge restriction categories as compared with the assigned standards and best uses and the likelihood that the discharge restriction category will contribute to achieving the protection goals.

(b) As appropriate, additional consideration may be given to:

(1) the potential effects of additional discharges from new, expanded, or changed facilities or activities on the water quality value of resource;

(2) the risk to the waters or the use of the waters from unintended or incidental discharges from new facilities; and

(3) the potential effects of physical accumulation or bioaccumulation of substances not addressed by ambient standards.

(c) Substantial weight will be given to obtaining consistency with provisions of existing watershed management or protection plans adopted or certified by the State or an entity of local government.

**Historical Note**

Sec. filed Sept. 7, 1993 eff. 30 days after filing.

## § 701.22 Allowable discharges.

New discharges may be permitted for waters where discharge restriction categories are assigned when such discharges result from environmental remediation projects, from projects correcting environmental or public health emergencies, or when such discharges result in a reduction of pollutants for the designated waters. In all cases, best usages and standards will be maintained.

**Historical Note**

Sec. filed Sept. 7, 1993 eff. 30 days after filing.

## § 701.23 No new discharge.

For waters designated "no new discharge," no new discharges shall be permitted, and no increase in any existing discharges shall be permitted. Storm water discharges are excepted from these restrictions. Storm water discharges and nonpoint sources of pollution shall be controlled by use of management practices to minimize the impact on the designated waters and shall comply with other applicable requirements of this Title.

**Historical Note**

Sec. filed Sept. 7, 1993 eff. 30 days after filing.

## § 701.24 No new discharge of a specified substance.

For waters designated "no new discharge of a specified substance," the specified substance shall not be permitted in new discharges. No increase in the release of the specified substance shall be permitted for any existing discharges. Storm water discharges are excepted from these restrictions. Storm water discharges and nonpoint sources of pollution shall be controlled by use of management practices to minimize the release of the specified substance to the designated

waters and shall comply with other applicable requirements of this Title. The substance will be specified at the time the waters are designated.

**Historical Note**

Sec. filed Sept. 7, 1993 eff. 30 days after filing.

## § 701.25 Severability.

If any provision of this Part or its application to any person or circumstance is held to be invalid, the remainder of this Part and the application of that provision to other persons or circumstances will not be affected.

**Historical Note**

Sec. added by renum. 701.19, filed Sept. 7, 1993 eff. 30 days after filing.

# PART 702

## DERIVATION AND USE OF STANDARDS AND GUIDANCE VALUES

(Statutory authority: Environmental Conservation Law, §§ 3-0301[2][m], 15-0313, 17-0301, 17-0303, 17-0809)

Sec.



**Historical Note**

Part repealed, new filed: April 28, 1972; Feb. 25, 1974; repealed, new (§§ 702.1-702.22) filed Aug. 2, 1991 eff. 30 days after filing.

### § 702.1 Basis for derivation of water quality standards and guidance values.

(a) The control of taste-, color- and odor-producing, toxic and other deleterious substances is implemented through the use of standards and guidance values. Standards and guidance values for such substances shall be derived according to the procedures set forth in this Part.

(b) The derivation of standards and guidance values will consider, to the extent possible, variations in natural or background conditions of waters, including but not limited to alkalinity, temperature, hardness and pH.

(c) Standards and guidance values shall be of the following Types to protect the best usages of the waters as described in Part 701 of this Title:

(1) Health (Water Source) or H(WS);

(2) Health (Fish Consumption) or H(FC);

(3) Aquatic (Chronic) or A(C);

(4) Aquatic (Acute) or A(A);

(5) Wildlife or W; and

(6) Aesthetic or E.

**Historical Note**

Sec. repealed, new filed: April 28, 1972; Feb. 25, 1974; amds. filed: Sept. 20, 1974; July 3, 1985; repealed, new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing. Added (c).

## § 702.2 Standards and guidance values for protection of human health and sources of potable water supplies.

(a) Standards and guidance values for protection of the best usage as a source of potable water supply shall protect human health and drinking water sources and are referred to as Health (Water Source) values.

(b) The standard or guidance value shall be the most stringent of the values derived using the procedures found in sections 702.3 through 702.7 of this Part.

(c) Standards or guidance values based on oncogenic effects, chronic nononcogenic effects or chemical correlation to oncogenic or chronic nononcogenic effects shall be derived based on the consumption of two liters of water per day. Standards or guidance values based on acute nononcogenic effects or chemical correlation to acute nononcogenic effects shall be derived based on the consumption of one liter of water per day or a different consumption rate if deemed appropriate.

**Historical Note**

Sec. repealed, new filed: April 28, 1972; Feb. 25, 1974; amd. filed June 20, 1988; repealed, new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing. Amended (a), added (c).

## § 702.3 Procedures for deriving standards and guidance values based on Specific MCLs and principal organic contaminant classes.

(a) The standard or guidance value shall be equal to the value of a Specific MCL unless the Specific MCL is based solely on aesthetic considerations.

(b) For a substance belonging to any of the principal organic contaminant classes and for which there is no Specific MCL, the standard or guidance value shall be 5 ug/L or a less stringent value as determined by the Commissioner of the New York State Department of Health.

**Historical Note**

Sec. amd. filed March 27, 1972; repealed, new filed: April 28, 1972; Feb. 25, 1974; amds. filed: Sept. 20, 1974; Sept. 20, 1985; repealed, new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing. Amended (a).

## § 702.4 Procedures for deriving standards and guidance values based on oncogenic effects.

(a) Values based on oncogenic effects shall be calculated using dose-response data from scientifically valid animal or human studies and a linearized multi-stage low-dose extrapolation model, unless the scientific evidence is determined to be sufficient to support the use of an alternative extrapolation model.

(b) Considering factors, including but not limited to route and duration of exposure, tumor type, species and statistical significance, the dose-response data deemed to be the most appropriate shall be used as a basis for the value.

(c) Other relevant toxicological information, including but not limited to mutagenicity, pharmacokinetics and protein-binding ability shall be considered in the selection of dose-response data and procedures used to derive the value.

(d) The 95 percent lower confidence limit on the dose corresponding to an excess lifetime cancer risk of one-in-one million shall be the basis of the value.

(e) Unless the scientific evidence is determined to be sufficient to support the use of an alternative trans-species conversion method, the human dose, in milligrams of substance per

kilogram of body weight per day, shall be calculated by multiplying the animal-to-human body weight ratio to the 0.25 power by the animal dose in milligrams of substance per kilogram of body weight per day.

(f) The value shall be based on an average 70 kilogram adult and an exposure of 70 years.

(g) The associated biological and mathematical uncertainties shall be considered in the establishment of the value.

**Historical Note**

Sec. amd. filed March 27, 1972; repealed, new filed: April 28, 1972; Feb. 25, 1974; repealed, filed June 20, 1988; new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing. Amended (e)-(f).

## § 702.5 Procedures for deriving standards and guidance values based on nononcogenic effects.

(a) Values shall be based on a dose that does not produce an observed effect (no-observed-effect level) derived from the results of scientifically valid human or animal studies determined most appropriate, considering factors, including but not limited to route and duration of exposure, effects, species and statistical significance. If a valid no-observed-effect level has not been determined, a minimal effect level may be used.

(b) The no-observed-effect level (NOEL) or the minimal effect level, expressed as a dose in milligrams of substance per kilogram of body weight, shall be divided by an uncertainty factor to obtain an acceptable daily intake (ADI). The magnitude of this factor will generally range from 10 to 1,000 and shall reflect the quantity and quality of the toxicologic data, the degree of confidence in the data and the nature of the effects of concern. Generally, the magnitude of the uncertainty factor shall be:

(1) 10 - where valid experimental results from prolonged exposure studies of humans and one or more animal species are available.

(2) 100 - where experimental results from prolonged exposures of humans are inconclusive or not available, and valid results of long-term studies on experimental animals exist.

(3) 1,000 - where experimental results of studies on human exposure are unavailable or inconclusive, and valid results from long-term ingestion studies on experimental animals are not available.

(c) Values based on chronic toxic effects shall allow no more than 20 percent of the ADI to come from drinking water and shall be derived based on an average 70-kilogram adult.

(d) Values based on acute toxic effects shall allow 20 percent of the ADI to come from drinking water and shall be derived based on an average 10-kilogram child. Alternative values for percentage of ADI or for body weight may be used if deemed appropriate.

**Historical Note**

Sec. repealed, new filed April 28, 1972; repealed, filed Feb. 25, 1974; new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing. Amended (c)-(d), repealed (e).

## § 702.6

**Historical Note**

Sec. repealed, filed March 22, 1968; new filed Aug. 2, 1991; repealed, filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.7 Procedure for deriving standards and guidance values based on chemical correlation.

Where the available data are deemed insufficient for deriving a value on the basis of either of sections 702.4 or 702.5 of this Part, a value may be based on correlation to a chemical for which a standard or guidance value has been established pursuant to those sections. Values based on chemical correlation may be established where similar toxic effects are anticipated because of similarity of functional groups or metabolic or toxicologic pathways.

**Historical Note**

Sec. repealed, filed March 22, 1968; new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.8 Procedures for deriving standards and guidance values for protection of human health from consumption of fish.

Standards and guidance values for the protection of the best usage of fishing shall protect the health of human consumers of finfish and, for Class SA waters, human consumers of shellfish from chemicals that may bioaccumulate and are referred to as Health (Fish Consumption) values.

(a) Standards and guidance values based on bioaccumulation and human consumption of fish shall be equal to the acceptable daily intake from fish consumption divided by a fish consumption rate of 0.033 kilograms per day and by a bioaccumulation factor.

(b) The acceptable daily intake, in micrograms per day, from fish consumption shall be the more stringent of:

(1) 20 percent of the ADI (for nononcogenic effects) as determined from section 702.5 or 702.7 of this Part; or

(2) the human dose (for oncogenic effects) as determined from section 702.4 or 702.7 of this Part.

(c) The bioaccumulation factor is the ratio of the concentration of a substance in fish flesh, in micrograms per kilogram, to the concentration in water, in micrograms per liter. Bioaccumulation factors will generally be based on measured values which may be supported by bioaccumulation factors derived from octanol/water partition coefficients.

**Historical Note**

Sec. filed May 24, 1967; repealed, new filed April 28, 1972; repealed, filed Feb. 25, 1974; new filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.9 Standards and guidance values for protection of aquatic life.

(a) Protection of the best usage of fishing shall include standards and guidance values for the protection of aquatic life.

(b) Standards and guidance values for the protection of propagation of aquatic life are referred to as Aquatic (Chronic) values.

(c) Standards and guidance values for the protection of survival of aquatic life are referred to as Aquatic (Acute) values.

(d) Where the waters are to be suitable for both fish propagation and survival, both Aquatic (Chronic) and Aquatic (Acute) standards or guidance values shall apply.

(e) Where the waters are to be suitable only for fish survival, Aquatic (Acute) standards and guidance values shall apply.

(f) Standards and guidance values shall be derived using the procedures found in section 706.1 of this Title.

(g) Where the available data are deemed insufficient for deriving a value on the basis of section 706.1 of this Title, a value may be based on correlation to a chemical for which a standard or guidance value has been established pursuant to that section where similar toxic effects are anticipated because of similarity of functional groups or metabolic or toxicologic pathways.

**Historical Note**

Sec. filed Aug. 2, 1991; repealed, new filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.10-702.12

**Historical Note**

Secs. filed Aug. 2, 1991; repealed, filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.13 Procedures for deriving standards and guidance values for protection of wildlife.

(a) Protection of the best usage of fishing shall include standards and guidance values for protection of the health of wildlife consumers of aquatic life and water. Such values are referred to as Wildlife values.

(b) Standards and guidance values to protect wildlife shall be derived using levels of chemicals known to be toxic to wildlife in conjunction with a bioaccumulation factor and wildlife consumption rates of aquatic life and water.

(c) Where the available data are deemed insufficient for deriving a value on the basis of subdivision (b) of this section, a value may be based on correlation to a chemical for which a standard or guidance value has been established pursuant to that subdivision. Values based on chemical correlation may be established where similar toxic effects are anticipated because of similarity of functional groups or metabolic or toxicologic pathways.

**Historical Note**

Sec. filed Aug. 2, 1991; repealed, new filed Feb. 10, 1998; amd. filed July 16, 1999 eff. Aug. 4, 1999. Amended (c).

## § 702.14 Procedures for deriving standards and guidance values based on aesthetic considerations.

(a) Protection of the best usage as a source of potable water supply shall include standards and guidance values to protect the aesthetic quality of the water. Protection of the best usage of fishing shall include standards and guidance values to prevent tainting of aquatic food.

(b) Standards and guidance values described in subdivision (a) of this section are referred to as Aesthetic values and shall be the most stringent of the values derived according to the procedures in subdivisions (c) through (e) of this section.

(c) Values based on aesthetic considerations for sources of potable water, including but not limited to taste, odor and discoloration, shall be based on an evaluation of the reported levels of the substance that affect the aesthetic quality of the water. Values derived in accordance with this section shall not exceed the value of a Specific MCL that is based on aesthetic considerations.

(d) Values based on tainting of aquatic food, including but not limited to taste, odor and discoloration, shall be based on an evaluation of the reported levels of the substance that affect the aesthetic quality of the fish flesh, aquatic life, wildlife or livestock that are consumed by humans and that acquire such flavor, odor or color because of habitation in, passage through, or ingestion of waters.

(e) Where the available data are deemed insufficient for deriving a value based on subdivision (c) or (d) of this section, a value may be established based on chemical correlation to a chemical for which a standard or guidance value has been established pursuant to those subdivisions, where similar aesthetic considerations are anticipated because of similarity of functional groups or metabolic or toxicologic pathways.

**Historical Note**

Sec. filed Aug. 2, 1991; repealed, new filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.15 Derivation of guidance values.

(a) For those substances that do not have an applicable Health (Water Source) standard in section 703.5 of this Title and that the department determines may pose a threat to human health if discharged to the waters of the State, a guidance value may be derived and shall be the more stringent of the following:

(1) the values derived by applying the procedures from sections 702.3 through 702.7 of this Part; or

(2) a "general organic guidance value" of 50 ug/L for an individual organic substance. This paragraph does not apply if adequate and sufficient data are available to justify values greater than 50 ug/L using procedures from both sections 702.4 and 702.5 of this Part.

(b) For those substances that do not have an applicable Health (Fish Consumption) standard in section 703.5 of this Title and that the department determines may pose a threat to human health if discharged to the waters of the State, a guidance value may be derived by applying the procedures from section 702.8 of this Part.

(c) (1) For those substances that do not have an applicable Aquatic (Chronic) standard in section 703.5 of this Title and that the department determines may pose a threat to aquatic life or the environment if discharged to the waters of the State, a guidance value may be derived by applying the appropriate procedure from section 702.9 of this Part.

(2) For those substances that have an identified applicable Aquatic (Chronic) standard in section 703.5 of this Title, a guidance value shall be substituted where the procedures in section 702.9 of this Part yield a more stringent value. Remarks in Table 1 of section 703.5(f) of this Title identify the standards to which this paragraph applies. This paragraph applies only to the waters of the Great Lakes System.

(d) (1) For those substances that do not have an applicable Aquatic (Acute) standard in section 703.5 of this Title and that the department determines may pose a threat to aquatic life or the environment if discharged to the waters of the State, a guidance value may be derived by applying the appropriate procedure from section 702.9 of this Part.

(2) For those substances that have an identified applicable Aquatic (Acute) standard in section 703.5 of this Title, a guidance value shall be substituted where the procedures in section 702.9 of this Part yield a more stringent value. Remarks in Table 1 of section 703.5(f) of this Title identify the standards to which this paragraph applies. This paragraph applies only to the waters of the Great Lakes System.

(e) For those substances that do not have an applicable Wildlife standard in section 703.5 of this Title and that the department determines may pose a threat to wildlife if discharged to the waters of the State, a guidance value may be derived by applying the appropriate procedure from section 702.13 of this Part.

(f) For those substances that do not have an applicable Aesthetic standard in section 703.5 of this Title and that the department determines may pose a threat to the aesthetic quality of sources of potable water or food for human consumption if discharged to the waters of the State, a guidance value may be derived by applying the appropriate procedure from section 702.14 of this Part.

**Historical Note**

Sec. filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.16 Derivation and implementation of effluent limitations.

(a) Standards and guidance values shall be used to control taste-, color- and odor-producing, toxic and deleterious substances, as specified in the narrative standards for fresh and saline surface waters and groundwaters and shall be the basis of water quality-based effluent limitations and groundwater effluent limitations for use in SPDES permits issued pursuant to Parts 750-758 of this Title.

(b) *Surface water effluent limitations.* (1) When deriving a water quality-based effluent limitation from a surface water standard or guidance value, the department may take into account factors, including but not limited to analytical detectability, treatability, natural background levels and the waste assimilative capacity of the receiving waters.

(2) Where these factors indicate that achieving a water quality-based effluent limitation would be clearly unreasonable, the department may substitute a modified effluent limitation. Where the effluent limitation had been derived from an aquatic standard or guidance value, the department shall also require biological monitoring.

(3) A surface water effluent limitation for the total of organic substances that have a Health (Water Source) standard for surface water in Table 1 of section 703.5(f) of this Title or a guidance value for surface water derived pursuant to section 702.15(a) of this Part shall be established based on an ambient value of 100 ug/L. Where such standards or guidance values are 100 ug/L or greater, they shall not be included in the total.

(c) *Groundwater effluent limitations.* (1) Groundwater effluent limitations are provided in Table 3 of section 703.6(e) of this Title. For those substances not included in Table 3 of section 703.6(e) of this Title and for which a guidance value has been derived as provided in section 702.15(a) or section 702.15(f) of this Part, the groundwater effluent limitation shall be equal to the guidance value.

(2) When implementing a groundwater effluent limitation, the department may take into account factors, including but not limited to analytical detectability and treatability.

(3) Where these factors indicate that achieving a groundwater effluent limitation as set forth in paragraphs (1) and (2) of this subdivision would be clearly unreasonable, the department may substitute a modified effluent limitation.

(4) A groundwater effluent limitation for the total of organic substances that have a groundwater standard in Table 1 of section 703.5(f) of this Title or a groundwater guidance value derived pursuant to section 702.15(a) of this Part shall be established at 100 ug/L. However, substances that have a groundwater standard or guidance value or groundwater effluent limitation of 100 ug/L or greater shall not be included in this total.

**Historical Note**

Sec. filed Aug. 2, 1991; amds. filed: Feb. 10, 1998; March 22, 1999; July 16, 1999 eff. Aug. 4, 1999. Amended (c)(2).

## § 702.17 Variances to effluent limitations based on standards and guidance values.

(a) The department may grant, to an applicant for a SPDES permit or to a SPDES permittee, a variance to a water quality-based effluent limitation or groundwater effluent limitation included in a SPDES permit.

(1) A variance applies only to the permittee identified in such variance and only to the pollutant specified in the variance. A variance does not affect or require the department to modify a corresponding standard or guidance value. A variance does not affect or require the department to modify a corresponding groundwater effluent limitation for the groundwater as a whole.

(2) A variance shall not apply to a new or recommencing discharger in the Great Lakes System unless the proposed discharge is a temporary one that is necessary to alleviate an imminent and substantial danger to the public health or the environment that is greater than the danger from not achieving the standard or guidance value. For the purpose of this Part, an imminent and substantial danger to the public health or the environment shall include, but not be limited to, a significant threat to the environment as defined in Part 375 of this Title.

(3) A variance shall not be granted that would likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of such species' critical habitat.

(4) A variance shall not be granted if standards or guidance values will be attained by implementing effluent limits required under section 754.1(a)(1) and (2) of this Title and by the permittee implementing cost-effective and reasonable best management practices for nonpoint source control.

(5) A variance term shall not exceed the term of the SPDES permit. Where the term of the variance is the same as the permit, the variance shall stay in effect until the permit is reissued, modified or revoked.

(b) A variance may be granted if the requester demonstrates that achieving the effluent limitation is not feasible because:

(1) naturally occurring pollutant concentrations prevent attainment of the standard or guidance value;

(2) natural, ephemeral, intermittent or low flow conditions or water levels prevent attainment, unless these conditions may be compensated for by the discharge of sufficient volume of effluent to enable the standard or guidance value to be met without violating water conservation requirements;

(3) human-caused conditions or sources of pollution prevent attainment of the standard or guidance value and cannot be remedied or would cause more environmental damage to correct than to leave in place;

(4) dams, diversions or other types of hydrologic modifications preclude attainment of the standard or guidance value, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in such attainment;

(5) physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate cover, flow, depth, pools, riffles, and the like, unrelated to chemical water quality, preclude attainment of the standard or guidance value; or

(6) controls more stringent than those required by section 754.1(a)(1) and (2) of this Title would result in substantial and widespread economic and social impact.

(c) In addition to the requirements of subdivision (b) of this section, the requestor shall also characterize, using adequate and sufficient data and principles, any increased risk to human health and the environment associated with granting the variance compared with attainment of the standard or guidance value absent the variance, and demonstrate to the satisfaction of the department that the risk will not adversely affect the public health, safety and welfare.

(d) The requestor shall submit a written application for a variance to the department. The application shall include:

(1) all relevant information demonstrating that achieving the effluent limitation is not feasible based on subdivision (b) of this section; and

(2) all relevant information demonstrating compliance with the conditions in subdivision (c) of this section.

(e) Where a request for a variance satisfies the requirements of this section, the department shall authorize the variance through the SPDES permit. The variance request shall be available to the public for review during the public notice period for the permit. The permit shall contain all conditions needed to implement the variance. Such conditions shall, at minimum, include:

(1) compliance with an initial effluent limitation that, at the time the variance is granted, represents the level currently achievable by the requestor, and that is no less stringent than that achieved under the previous permit where applicable;

(2) that reasonable progress be made toward achieving the effluent limitation based on the standard or guidance value, including, where reasonable, an effluent limitation more stringent than the initial effluent limitation;

(3) additional monitoring, biological studies and pollutant minimization measures as deemed necessary by the department;

(4) when the duration of a variance is shorter than the duration of a permit, compliance with an effluent limitation sufficient to meet the underlying standard or guidance value, upon the expiration of the variance; and

(5) a provision that allows the department to reopen and modify the permit for revisions to the variance.

(f) The department shall deny a variance request if the requestor fails to make the demonstrations required under subdivisions (b) and (c) of this section.

(g) A variance may be renewed, subject to the requirements of this section. As part of any renewal application, the permittee shall again demonstrate that achieving the effluent limitation is not feasible based on the requirements of this section. The permittee's application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance pursuant to subdivisions (b) and (c) of this section. Renewal of a variance may be denied if the permittee did not comply with the conditions of the original variance.

(h) Where the department determines that a multiple discharge variance is necessary to address widespread standard or guidance value attainment issues including the presence of a ubiquitous pollutant or naturally high levels of a pollutant in a watershed, the department, in lieu

of the discharger, may conduct the variance demonstration requirements in subdivisions (b) and (c) of this section. Any permittee accepting such variance shall be subject to the provisions of subdivision (e) of this section.

(i) The department will make available to the public a list of every variance that has been granted and that remains in effect.

**Historical Note**

Sec. filed Aug. 2, 1991; repealed, new filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.18 More stringent groundwater effluent limitations.

(a) The department, after consultation with the New York State Department of Health, may establish, on a case-by-case basis, more stringent effluent limitations than those set forth in section 703.6 of this Title or established by section 702.16(c)(1) of this Part, where necessary, to prevent pollution and protect the groundwaters for their best usages. The department shall consider rules and regulations promulgated by the administrator or the New York State Department of Health in establishing such limitations. Additionally, the department shall consider action levels for compounds determined to exhibit toxic effects which are established by the Commissioner of the New York State Department of Health.

(b) Circumstances under which the department may consider more stringent effluent limitations include but are not limited to the following:

(1) a discharge to an aquifer that is the sole or principal source of potable water supply;

(2) an existing or proposed discharge that is directly on or into consolidated rock or bedrock;

(3) a discharge containing one or more substances that in combination with precipitation and/or natural soil constituents is likely to produce a toxic pollutant; or

(4) where adverse cumulative or synergistic effects can be established for constituents in a discharge.

**Historical Note**

Sec. filed Aug. 2, 1991; amds. filed: Feb. 10, 1998; July 16, 1999 eff. Aug. 4, 1999. Amended (b).

## § 702.19 Modifications of groundwater effluent limitations.

(a) (1) An applicant for a SPDES permit or a SPDES permittee may make written application for a modification of a groundwater effluent limitation listed in Table 3 of section 703.6(e) of this Title or established pursuant to section 702.16(c)(1) of this Part.

(2) Such applicant shall have the burden of establishing to the satisfaction of the commissioner, that one or more of the effluent limitations are unnecessarily restrictive as to a particular discharge in that such modification would, notwithstanding noncompliance with such limitations, prevent pollution and protect the groundwaters for their best usages.

(b) Where a request for a modification of a groundwater effluent limitation satisfies the requirements of this section, the department shall authorize the modification through the SPDES permit. The modification request shall be available to the public for review during the public notice period for the permit. The permit shall contain all conditions needed to implement the modification.

**Historical Note**

Sec. filed Aug. 2, 1991; amds. filed: Feb. 10, 1998; March 22, 1999 eff. April 7, 1999. Amended (a)(1), (b).

## § 702.20 Studies and monitoring for discharges to groundwater.

(a) The department may require the submission of information by any person responsible for a discharge in order that the department may evaluate the short- and long-term effect the discharge may have on groundwaters of the State or for the purpose of determining additional

(section 702.15[a]of this Part) or more stringent (section 702.18 of this Part) effluent limitations or modifications (section 702.19 of this Part) thereto. Such information may include but is not limited to the following:

(1) a statement of the property to be affected by a discharge and the extent to which such property is under the control of the person responsible for such discharge;

(2) a geohydrologic analysis of the aquifers that may be affected;

(3) a determination of the direction and rate of movement of the discharge and the natural groundwater;

(4) an evaluation of adverse effects a discharge may have on any aquifer, source of potable water supply, or other surface waters or groundwaters of the State; and

(5) an evaluation of the ability of unconsolidated deposits, consolidated rock or bedrock and the groundwaters to attenuate potential pollutants such that the best usage of the groundwaters is maintained.

(b) The department may require the installation and operation of monitoring facilities in order to assure compliance with effluent limitations or to evaluate the effect of the discharge on the quality of the groundwater. Specific monitoring requirements shall be established by the department on a case-by-case basis and as may be required by Part 756 of this Title.

**Historical Note**

Sec. filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.21 Exceptions to groundwater effluent limitations.

(a) *Activities and conditions.* The effluent limitations set forth in section 703.6 of this Title or established pursuant to section 702.16(c)(1) of this Part for discharges to Class GA waters are not applicable to the following activities:

(1) the discharge of sewage without the admixture of industrial waste or other wastes where:

(i) a disposal system, point source or outlet consists of a subsurface sewage disposal system designed, constructed and maintained in accordance with guidelines and standards satisfactory to the department;

(ii) monitoring facilities are utilized in accordance with requirements as may be specified by the department; and

(iii) the disposal system is designed to discharge, and discharges, less than 30,000 gallons per day;

(2) normally accepted agricultural practice of utilizing chemicals and fertilizers for growing of crops for human and animal consumption; and

(3) waste management systems that employ land application techniques and have renovative capabilities provided it has been demonstrated to the satisfaction of the commissioner that:

(i) there will be no actual or potential public health hazard;

(ii) applicable water quality standards will be met in saturated zones; and

(iii) applicable water quality standards will not be contravened in any adjacent waters of the State.

(b) Nothing contained in this section shall be construed to allow any discharge that would preclude the best usage of Class GA waters specified in section 701.15 of this Title.

**Historical Note**

Sec. filed Aug. 2, 1991; amd. filed Feb. 10, 1998 eff. 30 days after filing.

## § 702.22 Severability.

If any provision of this Part or its application to any person or circumstance is held to be invalid, the remainder of this Part and the application of that provision to other persons or circumstances will not be affected.

**Historical Note**

Sec. filed Aug. 2, 1991 eff. 30 days after filing.

# PART 703

## SURFACE WATER AND GROUNDWATER QUALITY STANDARDS AND GROUNDWATER EFFLUENT LIMITATIONS

(Statutory authority: Environmental Conservation Law, §§ 3-0301[2][m], 15-0313, 17-0301, 17-0809)

Sec.



**Historical Note**

Part (§§ 703.1-703.4) filed March 20, 1967; repealed, new filed April 28, 1972; repealed, new (§§ 703.1-703.11) filed Aug. 2, 1978; repealed, new (§§ 703.1-703.7) filed Aug. 2, 1991; amd. filed July 16, 1999 eff. Aug. 4, 1999. Amended Part title.

### § 703.1 Substance form.

A water quality standard, guidance value or groundwater effluent limitation includes all (total) forms of the substance, unless indicated otherwise. Where a standard or guidance value is for a specific form of the substance, water quality-based effluent limitations for SPDES permits may include other forms of the substance to account for changes in the substance that occur in the receiving water.

**Historical Note**

Sec. filed March 20, 1967; repealed, new filed: April 28, 1972; Aug. 2, 1978; Aug. 2, 1991; amd. filed July 16, 1999 eff. Aug. 4, 1999.

### § 703.2 Narrative water quality standards.

Narrative standards for specific water classes are provided in this section. Narrative standards for classes N and AA-Special are provided in Part 701 of this Title.

| *Parameter* | *Classes* | *Standard* |
|---|---|---|
| Taste-, color-, and odor-producing, toxic and other deleterious substances | AA, A, B, C, D, SA, SB, SC, I, SD, A-Special, GA, GSA, GSB | None in amounts that will adversely affect the taste, color or odor thereof, or impair the waters for their best usages. |
| Turbidity | AA, A, B, C, D, SA, SB, SC, I, SD | No increase that will cause a substantial visible contrast to natural conditions. |
| Suspended, colloidal and settleable solids | AA, A, B, C, D, SA, SB, SC, I, SD, A-Special | None from sewage, industrial wastes or other wastes that will cause deposition or impair the waters for their best usages. |
| Oil and floating substances | AA, A, B, C, D, SA, SB, SC, I, SD, A-Special | No residue attributable to sewage, industrial wastes or other wastes, nor visible oil film nor globules of grease. |
| Garbage, cinders, ashes, oils, sludge and other refuse | SA, SB, SC, I, SD | None in any amounts. |

| | | |
|---|---|---|
| Phosphorus and nitrogen | AA, A, B, C, D, SA, SB, SC, I, SD, A-Special | None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages. |
| Radioactivity | A-Special | Should be kept at the lowest practicable levels, and in any event should be controlled to the extent necessary to prevent harmful effects on health. |
| Thermal discharges | GA, GSA, GSB | None in amounts that will impair the waters for their best usages. |
| Thermal discharges | AA, A, B, C, D, SA, SB, SC, I, SD, A-Special | See Part 704 of this Title. |

**Historical Note**

Sec. filed March 20, 1967; repealed, new filed: April 28, 1972; Aug. 2, 1978; Aug. 2, 1991 eff. 30 days after filing.

## § 703.3 Water quality standards for pH, dissolved oxygen, dissolved solids, odor, color and turbidity.

Standards for specific classes are provided in this section.

| *Parameter* | *Classes* | *Standard* |
|---|---|---|
| pH | AA, A, B, C, AA-Special, A-Special, GA | Shall not be less than 6.5 nor more than 8.5. |
| | D | Shall not be less than 6.0 nor more than 9.5. |
| | SA, SB, SC, I, SD | The normal range shall not be extended by more than one-tenth (0.1) of a pH unit. |
| Dissolved oxygen (DO) | A-Special | In rivers and upper waters of lakes, not less than 6.0 mg/L at any time. In hypolimnetic waters, it should not be less than necessary for the support of fishlife, particularly cold water species. |
| | AA, A, B, C, AA-Special | For cold waters suitable for trout spawning, the DO concentration shall not be less than 7.0 mg/L from other than natural conditions. For trout waters, the minimum daily average shall not be less than 6.0 mg/L, and at no time shall the concentration be less than 5.0 mg/L. For nontrout waters, the minimum daily average shall not be less than 5.0 mg/L, and at no time shall the DO concentration be less than 4.0 mg/L. |
| | D, SD | Shall not be less than 3.0 mg/L at any time. |
| | SA, SB, SC | Shall not be less than 5.0 mg/L at any time. |
| | I | Shall not be less than 4.0 mg/L at any time. |
| Dissolved solids | A-Special | Shall not exceed 200 mg/L. |
| | AA, A, B, C, AA-Special, GA | Shall be kept as low as practicable to maintain the best usage of waters but in no case shall it exceed 500 mg/L. |
| Odor | GA | Shall not exceed a threshold odor number of 3. |

| | | |
|---|---|---|
| Color | GA | Shall not exceed 15 color units (platinum-cobalt method). |
| Turbidity | GA | Shall not exceed 5 nephelometric units. |

**Historical Note**

Sec. filed March 20, 1967; repealed, new filed: April 28, 1972; Aug. 2, 1978; Aug. 2, 1991 eff. 30 days after filing.

## § 703.4 Water quality standards for coliforms.

Total and fecal coliform standards for specific classes are provided in this section.

(a) Total coliforms (number per 100 ml).

| *Classes* | *Standard* |
|---|---|
| AA | The monthly median value and more than 20 percent of the samples, from a minimum of five examinations, shall not exceed 50 and 240, respectively. |
| A, B, C, D, SB, SC | The monthly median value and more than 20 percent of the samples, from a minimum of five examinations, shall not exceed 2,400 and 5,000, respectively. |
| SA | The median most probable number (MPN) value in any series of representative samples shall not be in excess of 70. |
| I | The monthly geometric mean, from a minimum of five examinations, shall not exceed 10,000. |
| A-Special | The geometric mean, of not less than five samples, taken over not more than a 30-day period shall not exceed 1,000. |
| GA | The maximum allowable limit is 50. |

(b) Fecal coliforms (number per 100 ml).

| | |
|---|---|
| A, B, C, D, SB, SC | The monthly geometric mean, from a minimum of five examinations, shall not exceed 200. |
| I | The monthly geometric mean, from a minimum of five examinations, shall not exceed 2,000. |
| A-Special | The geometric mean, of not less than five samples, taken over not more than a 30-day period shall not exceed 200. |

(c) The total and fecal coliform standards for classes B, C, D, SB, SC and I shall be met during all periods when disinfection is practiced.

**Historical Note**

Sec. filed March 20, 1967; repealed, new filed: April 28, 1972; Aug. 2, 1978; amd. filed Nov. 5, 1984; repealed, new filed Aug. 2, 1991; amd. filed Dec. 10, 1993 eff. 30 days after filing. Amended (a).

## § 703.5 Water quality standards for taste-, color- and odor-producing, toxic and other deleterious substances.

(a) Water quality standards for specific substances or groups of substances are listed in Table 1 of subdivision (f) of this section for the applicable water classes. The substance name is listed with the associated Chemical Abstract Service Registry Number (CAS No.) where applicable. For entries in Table 1 of subdivision (f) of this section that refer to chemical groups, congeners or

other expressions of multiple substances, the standard applies to the sum of the substances, unless otherwise indicated.

(b) Standards are Health (Water Source), Health (Fish Consumption), Aquatic (Chronic), Aquatic (Acute), Wildlife or Aesthetic based and are respectively designated as H(WS), H(FC), A(C), A(A), W or E in the column headed "Type." Where more than one Type of standard is listed for a water class, the most stringent applies.

(c) The "Basis Code" in Table 1 of subdivision (f) of this section provides a further description of the basis of the standard. A list of basis codes is found in Table 2 of subdivision (f) of this section.

(d) The standard is the maximum allowable concentration in micrograms per liter (ug/L), unless otherwise noted. A standard defined by the symbol "ND" means not detectable by the analytical tests specified or approved pursuant to Part 700 of this Title.

(e) Special interpretive remarks are provided as necessary.

(f) *Tables.*

Table 1
(*cf. section 703.5*)

WATER QUALITY STANDARDS
SURFACE WATERS AND GROUNDWATER

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Acenaphthene (83-32-9) | A, A-S, AA, AA-S | 20 | E | U |
| Acrolein (107-02-8) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Acrylamide (79-06-1) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Acrylonitrile (107-13-1) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Alachlor (15972-60-8) | A, A-S, AA, AA-S | 0.5 | H(WS) | A |
| | GA | 0.5 | H(WS) | A |
| Aldicarb (116-06-3) | A, A-S, AA, AA-S | 7 | H(WS) | B |
| | GA | * | H(WS) | |
| Remark: * Refer to standards for "Aldicarb and Methomyl." | | | | |
| Aldicarb and Methomyl (116-06-3; 16752-77-5) | GA | 0.35* | H(WS) | F |
| Remark: * Applies to the sum of these substances. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Aldrin (309-00-2) | GA | ND | H(WS) | F |
| | A, A-S, AA, AA-S, B, C, D | * | H(FC) | |
| | SA, SB, SC, SD | * | H(FC) | |
| Remark: * | Refer to standards for "Aldrin and Dieldrin." | | | |
| Aldrin and Dieldrin (309-00-2; 60-57-1) | A, A-S, AA, AA-S, B, C, D | 0.001 | H(FC) | |
| | SA, SB, SC, SD | 0.001 | H(FC) | |
| Remark: * | Applies to the sum of these substances. | | | |
| Alkyldimethyl benzyl ammonium chloride (68391-01-5) | A, A-S, AA, AA-S, B, C | * | A(C) | |
| Remark: * | Refer to standards for "Quaternary ammonium compounds." | | | |
| Allyl chloride (107-05-1) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Aluminum, ionic (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | 100* | A(C) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | |
| Ametryn (834-12-8) | GA | 50 | H(WS) | J |
| 4-Aminobiphenyl (92-67-1) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Aminocresols (95-84-1; 2835-95-2; 2835-99-6) | A, A-S, AA, AA-S | * | E | |
| | GA | * | E | |
| | A, A-S, AA, AA-S, B, C | ** | E | |
| | D | ** | E | |
| Remarks: * | Refer to standards for "Phenolic compounds (total phenols)." | | | |
| ** | Refer to standards for "Phenols, total unchlorinated." | | | |
| 3-Aminotoluene (108-44-1) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 4-Aminotoluene (106-49-0) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Ammonia and Ammonium | A, A-S, AA, AA-S | 2,000* | H(WS) | H |
| (7664-41-7; | GA | 2,000* | H(WS) | H |
| CAS No. | A, A-S, AA, AA-S, B, C | ** | A(C) | |
| Not Applicable) | D | ** | A(A) | |

Remarks: * $NH_3 + NH_4^+$ as N.

** Un-ionized ammonia as $NH_3$; tables below provide the standard in ug/L at varying pH and temperature for different classes and specifications. Linear interpolation between the listed pH values and temperatures is applicable.

Classes A, A-S, AA, AA-S, B, C with the (T) or (TS) Specification

| pH | 0°C | 5°C | 10°C | 15°-30°C |
|---|---|---|---|---|
| 6.50 | 0.7 | 0.9 | 1.3 | 1.9 |
| 6.75 | 1.2 | 1.7 | 2.3 | 3.3 |
| 7.00 | 2.1 | 2.9 | 4.2 | 5.9 |
| 7.25 | 3.7 | 5.2 | 7.4 | 11 |
| 7.50 | 6.6 | 9.3 | 13 | 19 |
| 7.75 | 11 | 15 | 22 | 31 |
| 8.0-9.0 | 13 | 18 | 25 | 35 |

Classes A, A-S, AA, AA-S, B, C without the (T) or (TS) Specification

| pH | 0°C | 5°C | 10°C | 15°C | 20°-30°C |
|---|---|---|---|---|---|
| 6.50 | 0.7 | 0.9 | 1.3 | 1.9 | 2.6 |
| 6.75 | 1.2 | 1.7 | 2.3 | 3.3 | 4.7 |
| 7.00 | 2.1 | 2.9 | 4.2 | 5.9 | 8.3 |
| 7.25 | 3.7 | 5.2 | 7.4 | 11 | 15 |
| 7.50 | 6.6 | 9.3 | 13 | 19 | 26 |
| 7.75 | 11 | 15 | 22 | 31 | 43 |
| 8.0-9.0 | 13 | 18 | 25 | 35 | 50 |

Class D

| pH | 0°C | 5°C | 10°C | 15°C | 20°C | 25°-30°C |
|---|---|---|---|---|---|---|
| 6.50 | 9.1 | 13 | 18 | 26 | 36 | 51 |
| 6.75 | 15 | 21 | 30 | 42 | 59 | 84 |
| 7.00 | 23 | 33 | 46 | 66 | 93 | 131 |
| 7.25 | 34 | 48 | 68 | 95 | 140 | 190 |
| 7.50 | 45 | 64 | 91 | 130 | 180 | 260 |
| 7.75 | 56 | 80 | 110 | 160 | 220 | 320 |
| 8.0-9.0 | 65 | 92 | 130 | 180 | 260 | 370 |

## WATER QUALITY STANDARDS
## SURFACE WATERS AND GROUNDWATER

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Aniline | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (62-53-3) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Antimony | A, A-S, AA, AA-S | 3 | H(WS) | B |
| (CAS No. | GA | 3 | H(WS) | B |
| Not Applicable) | | | | |
| Arsenic | A, A-S, AA, AA-S | 50 | H(WS) | G |
| (CAS No. | GA | 25 | H(WS) | F |
| Not Applicable) | A, A-S, AA, AA-S, B, C | 150* | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | 340* | A(A) | |
| | SA, SB, SC | 63* | A(C) | |
| | SD | 120* | A(A) | |
| Remark: * | Dissolved arsenic form. | | | |
| Asbestos | A, A-S, AA, AA-S | * | H(WS) | G |
| (CAS No. | GA | * | H(WS) | G |
| Not Applicable) | | | | |
| Remark: * | 7,000,000 fibers (longer than 10 um)/L. | | | |
| Atrazine | GA | 7.5 | H(WS) | F |
| (1912-24-9) | | | | |
| Azinphosmethyl | GA | 4.4 | H(WS) | F |
| (86-50-0) | A, A-S, AA, AA-S, B, C | 0.005* | A(C) | |
| | SA, SB, SC | 0.01 | A(C) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | |
| Azobenzene | GA | * | H(WS) | J |
| (103-33-3) | | | | |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Barium | A, A-S, AA, AA-S | 1,000 | H(WS) | G |
| (CAS No. | GA | 1,000 | H(WS) | F |
| Not Applicable) | | | | |
| Benefin | GA | 35 | H(WS) | F |
| (1861-40-1) | | | | |
| Benzene | A, A-S, AA, AA-S | 1 | H(WS) | A |
| (71-43-2) | GA | 1 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | 10 | H(FC) | A |
| | SA, SB, SC, I, SD | 10 | H(FC) | A |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Benzidine (92-87-5) | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S, B, C | 0.1** | A(C) | |
| | D | 0.1** | A(A) | |
| Remarks: | * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| | ** For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title. | | | |
| Benzo(a)pyrene (50-32-8) | GA | ND | H(WS) | F |
| Beryllium (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | * | A(C) | |
| Remarks: | * 11 ug/L when hardness is less than or equal to 75 ppm; 1,100 ug/L when hardness is greater than 75 ppm. | | | |
| | ** For waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | |
| | Aquatic Type standards apply to acid-soluble form. | | | |
| 1,1'-Biphenyl (92-52-4) | GA | * | H(WS) | J |
| Remark: | * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Bis(2-chloro-ethoxy)methane (111-91-1) | GA | * | H(WS) | J |
| Remark: | * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Bis(2-chloro-ethyl)ether (111-44-4) | GA | 1.0 | H(WS) | F |
| Bis(chloromethyl)-ether (542-88-1) | GA | * | H(WS) | J |
| Remark: | * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Bis(2-chloro-1-methyl-ethyl)ether (108-60-1) | GA | * | H(WS) | J |
| Remark: | * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Bis(2-ethyl-hexyl)phthalate (117-81-7) | A, A-S, AA, AA-S | 5 | H(WS) | A |
| | GA | 5 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C | 0.6 | A(C) | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Boron | GA | 1,000 | H(WS) | H |
| (CAS No. | A, A-S, AA, AA-S, B, C | 10,000 | A(C) | |
| Not Applicable) | SA, SB, SC | 1,000 | A(C) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. Aquatic Type standards apply to acid-soluble form. | | | |
| Bromacil (314-40-9) | GA | 4.4 | H(WS) | F |
| Bromobenzene (108-86-1) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Bromochloromethane (74-97-5) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Bromomethane (74-83-9) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Butachlor (23184-66-9) | GA | 3.5 | H(WS) | F |
| cis-2-Butenal (15798-64-8) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| trans-2-Butenal (123-73-9) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| cis-2-Butenenitrile (1190-76-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| trans-2-Butenenitrile (627-26-9) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Butylate (2008-41-5) | GA | 50 | H(WS) | J |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| n-Butylbenzene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (104-51-8) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| sec-Butylbenzene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (135-98-8) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| tert-Butylbenzene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (98-06-6) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Cadmium | A, A-S, AA, AA-S | 5 | H(WS) | B,G |
| (CAS No. | GA | 5 | H(WS) | B,G |
| Not Applicable) | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | ** | A(A) | |
| | SA, SB, SC, I | 7.7 | A(C) | |
| | SD | 21 | A(A) | |
| Remarks: * (0.85) exp(0.7852 [ln (ppm hardness)] - 2.715)<br>** (0.85) exp(1.128 [ln (ppm hardness)] - 3.6867)<br>Aquatic Type standards apply to dissolved form. | | | | |
| Captan | GA | 18 | H(WS) | F |
| (133-06-2) | | | | |
| Carbaryl | GA | 29 | H(WS) | F |
| (63-25-2) | | | | |
| Carbofuran | A, A-S, AA, AA-S | 15 | H(WS) | B |
| (1563-66-2) | A, A-S, AA, AA-S, B, C | 1.0* | A(C) | |
| | D | 10* | A(A) | |
| Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title. | | | | |
| Carbon tetra-chloride | GA | 5 | H(WS) | F |
| (56-23-5) | | | | |
| Carboxin | GA | 50 | H(WS) | J |
| (5234-68-4) | | | | |
| Chloramben | GA | 50* | H(WS) | J |
| (CAS No. | | | | |
| Not Applicable) | | | | |
| Remark: * Includes: related forms that convert to the organic acid upon acidification to a pH of 2 or less; and esters of the organic acid. | | | | |
| Chloranil | GA | * | H(WS) | J |
| (118-75-2) | | | | |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Chlordane | A, A-S, AA, AA-S | 0.05 | H(WS) | A |
| (57-74-9) | GA | 0.05 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $2 \times 10^{-5}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $2 \times 10^{-5}$ | H(FC) | A |
| Chloride | A, A-S, AA, AA-S | 250,000 | H(WS) | H |
| (CAS No. Not Applicable) | GA | 250,000 | H(WS) | H |
| Chlorinated dibenzo-p-dioxins and Chlorinated dibenzofurans (CAS No. Not Applicable) | A, A-S, AA, AA-S | $7\times10^{-7}$* | H(WS) | A |
| | GA | $7\times10^{-7}$* | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $6\times10^{-10}$* | H(FC) | A |
| | SA, SB, SC, I, SD | $6\times10^{-10}$* | H(FC) | A |
| | A, A-S, AA, AA-S, B, C, D | $3.1\times10^{-9}$** | W | |
| | SA, SB, SC, I, SD | $3.1\times10^{-9}$** | W | |

Remarks: * Value is for the total of the chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans that are listed in the table below as equivalents of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD).

The 2,3,7,8-TCDD equivalent for a congener for the H(WS) standards is obtained by multiplying the concentration of that congener by its Toxicity Equivalency Factor (TEF) from the table below.

The 2,3,7,8-TCDD equivalent for a congener for the H(FC) standards is obtained by multiplying the concentration of that congener by its TEF and its Bioaccumulation Equivalency Factor (BEF) from the table below.

** Applies only to 2,3,7,8-TCDD

| CONGENER | TEF | BEF |
|---|---|---|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin | 1 | 1 |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 0.5 | 0.9 |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 0.1 | 0.3 |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 0.1 | 0.1 |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 0.1 | 0.1 |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 0.01 | 0.05 |
| Octachlorodibenzo-p-dioxin | 0.001 | 0.01 |
| 2,3,7,8-Tetrachlorodibenzofuran | 0.1 | 0.8 |
| 1,2,3,7,8-Pentachlorodibenzofuran | 0.05 | 0.2 |
| 2,3,4,7,8-Pentachlorodibenzofuran | 0.5 | 1.6 |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 0.1 | 0.08 |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 0.1 | 0.2 |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 0.1 | 0.7 |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 0.1 | 0.6 |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 0.01 | 0.01 |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 0.01 | 0.4 |
| Octachlorodibenzofuran | 0.001 | 0.02 |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Chlorine, Total Residual (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | 5 | A(C) | |
| | D | 19 | A(A) | |
| | SA, SB, SC, I | 7.5 | A(C) | |
| | SD | 13 | A(A) | |
| 2-Chloroaniline (95-51-2) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 3-Chloroaniline (108-42-9) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 4-Chloroaniline (106-47-8) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Chlorobenzene (108-90-7) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S, B, C, D | 400 | H(FC) | B |
| | SA, SB, SC, I, SD | 400 | H(FC) | B |
| | A, A-S, AA, AA-S, B, C | 5 | A(C) | |
| | A, A-S, AA, AA-S | 20 | E | U |
| | D | 50 | E | V |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 4-Chlorobenzotrifluoride (98-56-6) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 1-Chlorobutane (109-69-3) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Chloroethane (75-00-3) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Chloroform (67-66-3) | A, A-S, AA, AA-S | 7 | H(WS) | A |
| | GA | 7 | H(WS) | A |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Chloromethyl methyl ether (107-30-2) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2-Chloronaphthalene (91-58-7) | A, A-S, AA, AA-S | 10 | E | U |
| 2-Chloronitrobenzene (88-73-3) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 3-Chloronitrobenzene (121-73-3) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 4-Chloronitrobenzene (100-00-5) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Chloroprene (126-99-8) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Chlorothalonil (1897-45-6) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2-Chlorotoluene (95-49-8) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 3-Chlorotoluene (108-41-8) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 4-Chlorotoluene (106-43-4) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 4-Chloro-o-toluidine (95-69-2) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 5-Chloro-o-toluidine (95-79-4) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 3-Chloro-1,1,1-tri-fluoropropane (460-35-5) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Chromium (CAS No. Not Applicable) | A, A-S, AA, AA-S | 50 | H(WS) | G |
| | GA | 50 | H(WS) | G |
| | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | ** | A(A) | |
| Remarks: * (0.86) exp(0.819 [ln (ppm hardness)] + 0.6848)<br>** (0.316) exp(0.819 [ln (ppm hardness)] + 3.7256)<br>Aquatic Type standards apply to dissolved form and do not include hexavalent chromium. | | | | |
| Chromium (hexavalent) (CAS No. Not Applicable) | GA | 50 | H(WS) | F |
| | A, A-S, AA, AA-S, B, C | 11* | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | 16* | A(A) | |
| | SA, SB, SC | 54** | A(C) | |
| | SD | 1,200** | A(A) | |
| Remarks: * Applies to dissolved form.<br>** Applies to acid-soluble form. | | | | |
| Cobalt (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | 5* | A(C) | |
| Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title.<br>Aquatic Type standards apply to acid-soluble form. | | | | |
| Copper (CAS No. Not Applicable) | A, A-S, AA, AA-S | 200 | H(WS) | H |
| | GA | 200 | H(WS) | H |
| | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | ** | A(A) | |
| | SA, SB, SC, I | *** | A(C) | |
| | SA, SB, SC, I, SD | **** | A(A) | |
| * (0.96) exp(0.8545 [ln (ppm hardness)] - 1.702)<br>** (0.96) exp(0.9422 [ln (ppm hardness)] - 1.7)<br>*** Standard is 3.4 ug/L except in New York/New Jersey harbor where it is 5.6 ug/L.<br>**** Standard is 4.8 ug/L except in New York/New Jersey harbor where it is 7.9 ug/L.<br>Aquatic Type standards apply to dissolved form. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Cyanide | A, A-S, AA, AA-S | 200 | H(WS) | B |
| (CAS No. | GA | 200 | H(WS) | B |
| Not Applicable) | A, A-S, AA, AA-S, B, C, D | 9,000 | H(FC) | B |
| | SA, SB, SC, I, SD | 9,000 | H(FC) | B |
| | A, A-S, AA, AA-S, B, C | 5.2* | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | 22* | A(A) | |
| | SA, SB, SC | 1.0* | A(C) | |
| | SD | 1.0* | A(A) | |
| Remark: * | As free cyanide: the sum of HCN and $CN^-$ expressed as CN. | | | |
| Cyanogen bromide (506-68-3) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Cyanogen chloride (506-77-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Dalapon (CAS No. Not Applicable) | GA | 50* | H(WS) | J |
| Remark: * | Includes: related forms that convert to the organic acid upon acidification to a pH of 2 or less; and esters of the organic acid. | | | |
| p,p'-DDD | A, A-S, AA, AA-S | 0.3 | H(WS) | A |
| (72-54-8) | GA | 0.3 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $8 \times 10^{-5}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $8 \times 10^{-5}$ | H(FC) | A |
| | A, A-S, AA, AA-S, B, C, D | * | W | |
| | SA, SB, SC, I, SD | * | W | |
| Remark: * | See standard for p,p'-DDT. | | | |
| p,p'-DDE | A, A-S, AA, AA-S | 0.2 | H(WS) | A |
| (72-55-9) | GA | 0.2 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $7 \times 10^{-6}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $7 \times 10^{-6}$ | H(FC) | A |
| | A, A-S, AA, AA-S, B, C, D | * | W | |
| | SA, SB, SC, I, SD | * | W | |
| Remark: * | See standard for p,p'-DDT. | | | |
| p,p'-DDT | A, A-S, AA, AA-S | 0.2 | H(WS) | A |
| (50-29-3) | GA | 0.2 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $1 \times 10^{-5}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $1 \times 10^{-5}$ | H(FC) | A |
| | A, A-S, AA, AA-S, B, C, D | $1.1 \times 10^{-5}$* | W | |
| | SA, SB, SC, I, SD | $1.1 \times 10^{-5}$* | W | |
| Remark: * | Applies to the sum of p,p'-DDD, p,p'-DDE and p,p'-DDT. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Dechlorane Plus (13560-89-9) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Demeton (8065-48-3; 298-03-3; 126-75-0) | A, A-S, AA, AA-S, B, C | 0.1* | A(C) | |
| | SA, SB, SC | 0.1 | A(C) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. Standards apply to the sum of these substances. | | | |
| Diazinon (333-41-5) | GA | 0.7 | H(WS) | F |
| | A, A-S, AA, AA-S, B, C | 0.08* | A(C) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | |
| 1,2-Dibromobenzene (583-53-9) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,3-Dibromobenzene (108-36-1) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,4-Dibromobenzene (106-37-6) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,2-Dibromo-3-chloropropane (96-12-8) | A, A-S, AA, AA-S | 0.04 | H(WS) | A |
| | GA | 0.04 | H(WS) | A |
| Dibromodichloromethane (594-18-3) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Dibromomethane (74-95-3) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Di-n-butyl phthalate (84-74-2) | GA | 50 | H(WS) | J |
| Dicamba (1918-00-9) | GA | 0.44 | H(WS) | F |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Dichlorobenzenes | A, A-S, AA, AA-S | 3* | H(WS) | A |
| (95-50-1; 541-73-1; | GA | 3* | H(WS) | A |
| 106-46-7) | A, A-S, AA, AA-S, B, C | 5** | A(C) | |
| | A, A-S, AA, AA-S | 20***/30**** | E | U |
| | D | 50** | E | V |

Remarks: * Applies to each isomer ( 1,2-,1,3- and 1,4-dichlorobenzene) individually.
** Applies to the sum of 1,2-, 1,3- and 1,4-dichlorobenzene.
For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title.
*** Applies to 1,3-dichlorobenzene only.
**** Applies to 1,4-dichlorobenzene only.

| | | | | |
|---|---|---|---|---|
| 3,3'-Dichlorobenzidine (91-94-1) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 3,4-Dichlorobenzo-triflouride (328-84-7) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| cis-1,4-Dichloro-2-butene (1476-11-5) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| trans-1,4-Dichloro-2-butene (110-57-6) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| Dichlorodifluoromethane (75-71-8) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 1,1-Dichloroethane (75-34-3) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 1,2-Dichloroethane (107-06-2) | A, A-S, AA, AA-S | 0.6 | H(WS) | A |
| | GA | 0.6 | H(WS) | A |
| 1,1-Dichloroethene (75-35-4) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| cis-1,2-Dichloroethene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (156-59-2) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| trans-1,2-Dichloroethene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (156-60-5) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Dichlorofluoromethane | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (75-43-4) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,4-Dichlorophenol | A, A-S, AA, AA-S | 0.3* | E | U |
| (120-83-2) | GA | ** | E | |
| | A, A-S, AA, AA-S, B, C, D | *** | E | |
| Remarks: * Also see standards for "Phenolic compounds (total phenols)." ** Refer to standards for "Phenolic compounds (total phenols)." *** Refer to standards for "Phenols, total chlorinated." | | | | |
| 2,4-Dichloro-phenoxyacetic acid (94-75-7) | A, A-S, AA, AA-S | 50 | H(WS) | G |
| | GA | 50 | H(WS) | G |
| 1,1-Dichloropropane | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (78-99-9) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 1,2-Dichloropropane | A, A-S, AA, AA-S | 1 | H(WS) | A |
| (78-87-5) | GA | 1 | H(WS) | A |
| 1,3-Dichloropropane | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (142-28-9) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,2-Dichloropropane | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (594-20-7) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 1,3-Dichloropropene | A, A-S, AA, AA-S | 0.4* | H(WS) | A |
| (542-75-6) | GA | 0.4* | H(WS) | A |
| Remark: * Applies to the sum of cis- and trans-1,3-dichloropropene, CAS Nos. 10061-01-5 and 10061-02-6, respectively. | | | | |
| 2,3-Dichlorotoluene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (32768-54-0) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 2,4-Dichlorotoluene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (95-73-8) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,5-Dichlorotoluene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (19398-61-9) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,6-Dichlorotoluene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (118-69-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 3,4-Dichlorotoluene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (95-75-0) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 3,5-Dichlorotoluene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (25186-47-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Dieldrin | A, A-S, AA, AA-S | 0.004 | H(WS) | A |
| (60-57-1) | GA | 0.004 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $6 \times 10^{-7}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $6 \times 10^{-7}$ | H(FC) | A |
| | A, A-S, AA, AA-S, B, C | 0.056 | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | 0.24 | A(A) | |
| Di(2-ethylhexyl)adipate | A, A-S, AA, AA-S | 20 | H(WS) | A |
| (103-23-1) | GA | 20 | H(WS) | A |
| 1,2-Difluoro-1,1,2,2-tetrachloroethane (76-12-0) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,2-Diisopropylbenzene (577-55-9) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,3-Diisopropylbenzene (99-62-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 1,4-Diisopropylbenzene (100-18-5) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| N,N-Dimethylaniline (121-69-7) | A, A-S, AA, AA-S | 1 | H(WS) | A |
| | GA | 1 | H(WS) | A |
| 2,3-Dimethylaniline (87-59-2) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,4-Dimethylaniline (95-68-1) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,5-Dimethylaniline (95-78-3) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,6-Dimethylaniline (87-62-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 3,4-Dimethylaniline (95-64-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 3,5-Dimethylaniline (108-69-0) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 3,3'-Dimethylbenzidine (119-93-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 4,4'-Dimethylbibenzyl (538-39-6) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 4,4'-Dimethyldiphenyl-methane (4957-14-6) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| alpha, alpha-Dimethyl phenethylanmine (122-09-8) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,4-Dimethylphenol (105-67-9) | A, A-S, AA, AA-S, B, C, D | 1,000 | H(FC) | B |
| | SA, SB, SC, I, SD | 1,000 | H(FC) | B |
| | A, A-S, AA, AA-S | * | E | |
| | GA | * | E | |
| | B, C, D | ** | E | |
| Remarks: * Refer to standards for "Phenolic compounds (total phenols)." ** Refer to standard for "Phenols, total unchlorinated." | | | | |
| Dimethyl tetrachloro-terephthalate (1861-32-1) | GA | 50 | H(WS) | J |
| 1,3-Dinitrobenzene (99-65-0) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,4-Dinitrophenol (51-28-5) | A, A-S, AA, AA-S, B, C, D | 400 | H(FC) | B |
| | SA, SB, SC, I, SD | 400 | H(FC) | B |
| | A, A-S, AA, AA-S | * | E | |
| | GA | * | E | |
| | B, C, D | ** | E | |
| Remarks: * Refer to standards for "Phenolic compounds (total phenols)." ** Refer to standards for "Phenols, total unchlorinated." | | | | |
| 2,3-Dinitrotoluene (602-01-7) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,4-Dinitrotoluene (121-14-2) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,5-Dinitrotoluene (619-15-8) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,6-Dinitrotoluene (606-20-2) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 3,4-Dinitrotoluene (610-39-9) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 3,5-Dinitrotoluene (618-85-9) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Diphenamid (957-51-7) | GA | 50 | H(WS) | J |
| Diphenylamine (122-39-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Diphenyl-hydrazines (122-66-7; 530-50-7) | GA | ND* | H(WS) | F |
| Remark: * | Applies to the sum of 1,1- and 1,2-diphenylhydrazine, CAS Nos. 530-50-7 and 122-66-7, respectively. | | | |
| Diquat (2764-72-9) | A, A-S, AA, AA-S | 20* | H(WS) | B |
| | GA | 20* | H(WS) | B |
| Remark: * | Applies to the concentration of diquat ion whether free or as an undissociated salt. | | | |
| Disulfoton (298-04-4) | GA | * | H(WS) | |
| Remark: * | Refer to standards for "Phorate and Disulfoton." | | | |
| Dyphylline (479-18-5) | A, A-S, AA, AA-S | 50 | H(WS) | B |
| Endosulfan (115-29-7) | A, A-S, AA, AA-S, B, C | 0.009 | A(C) | |
| | D | 0.22* | A(A) | |
| | SA, SB, SC | 0.001 | A(C) | |
| | SD | 0.034 | A(A) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(d) of this Title. | | | |
| Endrin (72-20-8) | A, A-S, AA, AA-S | 0.2 | H(WS) | G |
| | GA | ND | H(WS) | F |
| | A, A-S, AA, AA-S, B, C, D | 0.002 | H(FC) | |
| | SA, SB, SC, SD | 0.002 | H(FC) | |
| | A, A-S, AA, AA-S, B, C | 0.036 | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | 0.086 | A(A) | |
| Endrin aldehyde (7421-93-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Endrin ketone (53494-70-5) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Ethylbenzene (100-41-4) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Ethylene dibromide (106-93-4) | A, A-S, AA, AA-S | $6 \times 10^{-4}$ | H(WS) | A |
| | GA | $6 \times 10^{-4}$ | H(WS) | A |
| Ethylenethiourea (96-45-7) | GA | ND | H(WS) | F |
| Ferbam (14484-64-1) | GA | 4.2 | H(WS) | F |
| Fluometuron (2164-17-2) | GA | 50 | H(WS) | J |
| Fluoride (CAS No. Not Applicable) | A, A-S, AA, AA-S | 1,500 | H(WS) | H |
| | GA | 1,500 | H(WS) | F |
| | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | D | ** | A(A) | |
| Remarks: * (0.02) exp(0.907 [ln (ppm hardness)] + 7.394)<br>** (0.1) exp(0.907 [ln (ppm hardness)] + 7.394)<br>For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title. | | | | |
| Foaming agents (CAS No. Not Applicable) | GA | 500* | E | U |
| Remark: * Determined as methylene blue active substances (MBAS) or by other tests as specified by the commissioner. | | | | |
| Folpet (133-07-3) | GA | 50 | H(WS) | J |
| Gross alpha radiation (CAS No. Not Applicable) | A, A-S, AA, AA-S | * | H(WS) | G |
| | GA | * | H(WS) | G |
| Remark: * 15 picocuries per liter, excluding radon and uranium. | | | | |
| Gross beta radiation (CAS No. Not Applicable) | A, AA | * | H(WS) | H |
| | GA | * | H(WS) | H |
| Remark: * 1,000 picocuries per liter, excluding strontium-90 and alpha emitters. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Heptachlor (76-44-8) | A, A-S, AA, AA-S | 0.04 | H(WS) | A |
| | GA | 0.04 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $2 \times 10^{-4}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $2 \times 10^{-4}$ | H(FC) | A |
| Heptachlor epoxide (1024-57-3) | A, A-S, AA, AA-S | 0.03 | H(WS) | A |
| | GA | 0.03 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $3 \times 10^{-4}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $3 \times 10^{-4}$ | H(FC) | A |
| Hexachloro-benzene (118-74-1) | A, A-S, AA, AA-S | 0.04 | H(WS) | A |
| | GA | 0.04 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $3 \times 10^{-5}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $3 \times 10^{-5}$ | H(FC) | A |
| Hexachloro-butadiene (87-68-3) | A, A-S, AA, AA-S | 0.5 | H(WS) | B |
| | GA | 0.5 | H(WS) | B |
| | A, A-S, AA, AA-S, B, C, D | 0.01 | H(FC) | B |
| | SA, SB, SC, I, SD | 0.01 | H(FC) | B |
| | A, A-S, AA, AA-S, B, C | 1.0* | A(C) | |
| | D | 10* | A(A) | |
| | SA, SB, SC | 0.3 | A(C) | |
| | SD | 3.0 | A(A) | |
| alpha-Hexachloro-cyclohexane (319-84-6) | A, A-S, AA, AA-S | 0.01 | H(WS) | A |
| | GA | 0.01 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | 0.002 | H(FC) | A |
| | SA, SB, SC, I, SD | 0.002 | H(FC) | A |
| beta-Hexachloro-cyclohexane (319-85-7) | A, A-S, AA, AA-S | 0.04 | H(WS) | A |
| | GA | 0.04 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | 0.007 | H(FC) | A |
| | SA, SB, SC, I, SD | 0.007 | H(FC) | A |
| delta-Hexachloro-cyclohexane (319-86-8) | A, A-S, AA, AA-S | 0.04 | H(WS) | A |
| | GA | 0.04 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | 0.008 | H(FC) | A |
| | SA, SB, SC, I, SD | 0.008 | H(FC) | A |
| epsilon-Hexachloro-cyclohexane (6108-10-7) | A, A-S, AA, AA-S | 0.04 | H(WS) | A |
| | GA | 0.04 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | 0.008 | H(FC) | A |
| | SA, SB, SC, I, SD | 0.008 | H(FC) | A |
| gamma-Hexachloro-cyclohexane (58-89-9) | A, A-S, AA, AA-S | 0.05 | H(WS) | A |
| | GA | 0.05 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | 0.008 | H(FC) | A |
| | SA, SB, SC, I, SD | 0.008 | H(FC) | A |
| | A, A-S, AA, AA-S, B, C, D | 0.95 | A(A) | |

Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title.

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Hexachloro-cyclopentadiene (77-47-4) | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S, B, C | 0.45** | A(C) | |
| | D | 4.5** | A(A) | |
| | SA, SB, SC | 0.07 | A(C) | |
| | SD | 0.7 | A(A) | |
| | A, A-S, AA, AA-S | 1.0 | E | U |

Remarks: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

** For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title.

| | | | | |
|---|---|---|---|---|
| Hexachloroethane (67-72-1) | A, A-S, AA, AA-S | 5 | H(WS) | A, I |
| | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S, B, C, D | 0.6 | H(FC) | A |
| | SA, SB, SC, I, SD | 0.6 | H(FC) | A |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| Hexachlorophene (70-30-4) | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S | ** | E | |
| | GA | ** | E | |
| | B, C, D | *** | E | |

Remarks: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

** Refer to standards for "Phenolic compounds (total phenols)."

*** Refer to standards for "Phenols, total chlorinated."

| | | | | |
|---|---|---|---|---|
| Hexachloropropene (1888-71-7) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| Hexazinone (51235-04-2) | GA | 50 | H(WS) | J |

| | | | | |
|---|---|---|---|---|
| Hydrazine (302-01-2) | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | D | ** | A(A) | |

Remarks: * 5 ug/L at less than 50 ppm hardness and 10 ug/L at greater than or equal to 50 ppm hardness.

** 50 ug/L at less than 50 ppm hardness and 100 ug/L at greater than or equal to 50 ppm hardness.

For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title.

| | | | | |
|---|---|---|---|---|
| Hydrogen sulfide (7783-06-4) | A, A-S, AA, AA-S, B, C | 2.0* | A(C) | |
| | SA, SB, SC | 2.0 | A(C) | |

Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title.

Aquatic Type standards apply to undissociated form.

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Hydroquinone (123-31-9) | A, A-S, AA, AA-S, B, C | 2.2** | A(C) | |
| | D | 4.4** | A(A) | |
| | A, A-S, AA, AA-S | * | E | |
| | GA | * | E | |

Remarks: * Refer to standards for "Phenolic compounds (total phenols)."
** For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title.

| | | | | |
|---|---|---|---|---|
| Iron (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | 300** | A(C) | |
| | D | 300** | A(A) | |
| | A, A-S, AA, AA-S | 300 | E | G |
| | GA | 300* | E | F |

Remarks: * Also see standard for "Iron and Manganese."
** For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title.

| | | | | |
|---|---|---|---|---|
| Iron and Manganese (CAS No. Not Applicable) | GA | 500* | E | F |

Remark: * Applies to the sum of these substances; also see individual standards for "Iron" and "Manganese."

| | | | | |
|---|---|---|---|---|
| Isodecyl diphenyl phosphate (29761-21-5) | A, A-S, AA, AA-S, B, C | 1.7* | A(C) | |
| | D | 22* | A(A) | |

Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title.

| | | | | |
|---|---|---|---|---|
| Isodrin (465-73-6) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| Isopropalin (33820-53-0) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| Isopropylbenzene (98-82-8) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 2-Isopropyltoluene (527-84-4) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 3-Isopropyltoluene (535-77-3) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 4-Isopropyltoluene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (99-87-6) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Isothiazolones, total (isothiazolinones) (includes 5-chloro-2-methyl-4-isothiazolin-3-one & 2-methyl-4-isothiazolin-3-one) (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | 1* | A(C) | |
| | D | 10* | A(A) | |
| Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title. Standards apply to the sum of these substances. | | | | |
| Kepone (143-50-0) | GA | ND | H(WS) | F |
| Lead | A, A-S, AA, AA-S | 50 | H(WS) | G |
| (CAS No. | GA | 25 | H(WS) | F |
| Not Applicable) | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | ** | A(A) | |
| | SA, SB, SC, I | 8 | A(C) | |
| | SA, SB, SC, I, SD | 204 | A(A) | |
| Remarks: * {1.46203 - [ln (hardness) (0.145712)] } exp (1.273 [ln (hardness)] - 4.297) ** {1.46203 - [ln (hardness) (0.145712)] } exp (1.273 [ln (hardness)] - 1.052) Aquatic Type standards apply to dissolved form. | | | | |
| Linear alkyl benzene sulfonates (LAS) (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | 40* | A(C) | |
| Remarks: * LAS with side chains greater than 13 carbons only; applies to the sum of these substances. * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | | |
| Magnesium (CAS No. Not Applicable) | A, A-S, AA, AA-S | 35,000 | H(WS) | B |
| Malathion | GA | 7.0 | H(WS) | F |
| (121-75-5) | A, A-S, AA, AA-S, B, C | 0.1* | A(C) | |
| | SA, SB, SC | 0.1 | A(C) | |
| Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | | |
| Mancozeb (8018-01-7) | GA | 1.8 | H(WS) | F |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Maneb (12427-38-2) | GA | 1.8 | H(WS) | F |
| Manganese (CAS No. Not Applicable) | A, A-S, AA, AA-S | 300 | E | G |
| | GA | 300* | E | F |
| Remark: * | Also see standards for "Iron and Manganese." | | | |
| Mercury (CAS No. Not Applicable) | A, A-S, AA, AA-S | 0.7 | H(WS) | B |
| | GA | 0.7 | H(WS) | B |
| | A, A-S, AA, AA-S, B, C, D | $7 \times 10^{-4}$* | H(FC) | B |
| | SA, SB, SC, I, SD | $7 \times 10^{-4}$* | H(FC) | B |
| | A, A-S, AA, AA-S, B, C | 0.77* | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | 1.4* | A(A) | |
| | A, A-S, AA, AA-S, B, C, D | 0.0026* | W | |
| | SA, SB, SC, I, SD | 0.0026* | W | |
| Remark: * | Applies to dissolved form. | | | |
| Methacrylonitrile (126-98-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Methomyl (16752-77-5) | GA | * | H(WS) | |
| Remark: * | Refer to standard for "Aldicarb and Methomyl." | | | |
| Methoxychlor (72-43-5) | A, A-S, AA, AA-S | 35 | H(WS) | H |
| | GA | 35 | H(WS) | F |
| | A, A-S, AA, AA-S, B, C | 0.03* | A(C) | |
| | SA, SB, SC | 0.03 | A(C) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | |
| N-Methylaniline (100-61-8) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Methyl chloride (74-87-3) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2-Methyl-4-chloro-phenoxyacetic acid (94-74-6) | GA | 0.44 | H(WS) | F |
| 4,4'-Methylene-bis-(2-chloroaniline) (101-14-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 4,4'-Methylene-bis-(N-methyl)aniline (1807-55-2) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 4,4'-Methylene-bis-(N,N'-dimethyl) aniline (101-61-1) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Methylene bisthiocyanate (6317-18-6) | A, A-S, AA, AA-S, B, C | 1.0* | A(C) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | |
| Methylene chloride (75-09-2) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S, B, C, D | 200 | H(FC) | A |
| | SA, SB, SC, I, SD | 200 | H(FC) | A |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Methyl iodide (74-88-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Methyl methacrylate (80-62-6) | GA | 50 | H(WS) | J |
| Methyl parathion (298-00-0) | GA | * | H(WS) | |
| | A, A-S, AA, AA-S, B, C | * | A(C) | |
| Remark: * | Refer to the standards for "Parathion and Methyl parathion." | | | |
| alpha-Methylstyrene (98-83-9) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2-Methylstyrene (611-15-4) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 3-Methylstyrene (100-80-1) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 4-Methylstyrene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (622-97-9) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Metribuzin | GA | 50 | H(WS) | J |
| (21087-64-9) | | | | |
| Mirex | A, A-S, AA, AA-S | 0.03 | H(WS) | A |
| (2385-85-5) | GA | 0.03 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $1 \times 10^{-6}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $1 \times 10^{-6}$ | H(FC) | A |
| | A, A-S, AA, AA-S, B, C | 0.001* | A(C) | |
| | D | 0.001* | A(A) | |
| | SA, SB, SC | 0.001 | A(C) | |
| Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title. | | | | |
| Nabam | GA | 1.8 | H(WS) | F |
| (142-59-6) | | | | |
| Naphthalene | A, A-S, AA, AA-S | 10 | E | U |
| (91-20-3) | | | | |
| Niacinamide | A, A-S, AA, AA-S | 500 | H(WS) | B |
| (98-92-0) | | | | |
| Nickel | A, A-S, AA, AA-S | 100 | H(WS) | B |
| (CAS No. | GA | 100 | H(WS) | B |
| Not Applicable) | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | ** | A(A) | |
| | SA, SB, SC, I | 8.2 | A(C) | |
| | SA, SB, SC, I, SD | 74 | A(A) | |
| Remarks: * (0.997) exp (0.846 [ln (hardness)] + 0.0584)<br>** (0.998) exp (0.846 [ln (hardness)] + 2.255)<br>Aquatic Type standards apply to dissolved form. | | | | |
| Nitralin | GA | 35 | H(WS) | F |
| (4726-14-1) | | | | |
| Nitrate (expressed as N) | A, A-S, AA, AA-S | 10,000* | H(WS) | G |
| (CAS No. | GA | 10,000* | H(WS) | G |
| Not Applicable) | | | | |
| Remark: * Also see standards for "Nitrate and Nitrite." | | | | |
| Nitrate and Nitrite | A, A-S, AA, AA-S | 10,000* | H(WS) | G |
| (expressed as N) | GA | 10,000* | H(WS) | G |
| (CAS No. | | | | |
| Not Applicable) | | | | |
| Remark: * Applies to the sum of these substances; also see individual standards for "Nitrate" and "Nitrite." | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Nitrilotri- | A, A-S, AA, AA-S | 3* | H(WS) | A |
| acetic acid | GA | 3* | H(WS) | A |
| (CAS No. | A, A-S, AA, AA-S, B, C | 5,000** | A(C) | |
| Not Applicable) | | | | |

Remarks: * Includes related forms that convert to nitrilotriacetic acid upon acidification to a pH of 2.3 or less.
** Applies to nitrilotriacetate.
** For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title.

| | | | | |
|---|---|---|---|---|
| Nitrite (expressed as N) | A, A-S, AA, AA-S | 1,000* | H(WS) | G |
| (CAS No. | GA | 1,000* | H(WS) | G |
| Not Applicable) | A, A-S, AA, AA-S, B, C | ** | A(C) | |

Remarks: * Also see standards for "Nitrate and Nitrite."
** Standard is 100 ug/L for warm water fishery waters and 20 ug/L for cold water fishery waters.
** For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title.

| | | | | |
|---|---|---|---|---|
| 2-Nitroaniline (88-74-4) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 3-Nitroaniline (99-09-2) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 4-Nitroaniline (100-01-6) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| Nitrobenzene | A, A-S, AA, AA-S | 0.4 | H(WS) | A |
| (98-95-3) | GA | 0.4 | H(WS) | A |
| | A, A-S, AA, AA-S | 30 | E | U |
| 2-Nitrotoluene (88-72-2) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 3-Nitrotoluene (99-08-1) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | | |
|---|---|---|---|---|
| 4-Nitrotoluene (99-99-0) | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 5-Nitro-o-toluidine (99-55-8) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Octachlorostyrene (29082-74-4) | A, A-S, AA, AA-S | 0.2 | H(WS) | B |
| | GA | 0.2 | H(WS) | B |
| | A, A-S, AA, AA-S, B, C, D | $6 \times 10^{-6}$ | H(FC) | B |
| | SA, SB, SC, I, SD | $6 \times 10^{-6}$ | H(FC) | B |
| Oxamyl (23135-22-0) | GA | 50 | H(WS) | J |
| Paraquat (4685-14-7) | GA | 3.0 | H(WS) | F |
| Parathion (56-38-2) | GA | * | H(WS) | |
| | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | 0.065 | A(A) | |
| Remark: * Refer to standards for "Parathion and Methyl parathion." | | | | |
| Parathion and Methyl parathion (56-38-2; 298-00-0) | GA | 1.5* | H(WS) | F |
| | A, A-S, AA, AA-S, B, C | 0.008** | A(C) | |
| Remarks: * Applies to the sum of these substances. | | | | |
| ** Applies to the sum of these substances. For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | | |
| Pendimethalin (40487-42-1) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Pentachloro-benzene (608-93-5) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Pentachloroethane (76-01-7) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Pentachloro-nitrobenzene (82-68-8) | GA | ND | H(WS) | F |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Pentachloro- phenol (87-86-5) | A, A-S, AA, AA-S, B, C | * | A(C) | |
| | A, A-S, AA, AA-S, B, C, D | ** | A(A) | |
| | A, A-S, AA, AA-S | *** | E | |
| | GA | *** | E | |
| | B, C, D | **** | E | |
| Remarks: | * exp [1.005 (pH) - 5.134] | | | |
| | ** exp [1.005 (pH) - 4.869] | | | |
| | *** Refer to standards for "Phenolic compounds (total phenols)." | | | |
| | **** Refer to standards for "Phenols, total chlorinated." | | | |
| Phenol (108-95-2) | A, A-S, AA, AA-S | * | E | |
| | GA | * | E | |
| | B, C, D | ** | E | |
| Remarks: | * Refer to standards for "Phenolic compounds (total phenols)." | | | |
| | ** Refer to standards for "Phenols, total unchlorinated." | | | |
| Phenolic compounds (total phenols) (CAS No. Not Applicable) | A, A-S, AA, AA-S | 1* | E | U |
| | GA | 1* | E | U |
| Remark: | * Applies to the sum of these substances. | | | |
| Phenols, total chlorinated (CAS No. Not Applicable) | A, A-S, AA, AA-S | * | E | |
| | GA | * | E | |
| | A, A-S, AA, AA-S, B, C, D | 1.0** | E | V |
| Remarks: | * Refer to standards for "Phenolic compounds (total phenols)." | | | |
| | ** Applies to the sum of these substances. | | | |
| Phenols, total unchlorinated (CAS No. Not Applicable) | A, A-S, AA, AA-S | * | E | |
| | GA | * | E | |
| | A, A-S, AA, AA-S, B, C, D | 5.0** | E | V |
| Remarks: | * Refer to standards for "Phenolic compounds (total phenols)." | | | |
| | ** Applies to the sum of these substances. | | | |
| 1,2-Phenylenediamine (95-54-5) | GA | * | H(WS) | J |
| Remark: | * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,3-Phenylenediamine (108-45-2) | GA | * | H(WS) | J |
| Remark: | * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,4-Phenylenediamine (106-50-3) | GA | * | H(WS) | J |
| Remark: | * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Phenyl ether (101-84-8) | A, A-S, AA, AA-S | 10 | E | U |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Phenylhydrazine (100-63-0) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 3-Phenyl-1-propene (637-50-3) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| cis-1-Phenyl-1-propene (766-90-5) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| trans-1-Phenyl-1-propene (873-66-5) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Phorate (298-02-2) | GA | * | H(WS) | |
| Remark: * | Refer to standards for "Phorate and Disulfoton." | | | |
| Phorate and Disulfoton (298-02-2; 298-04-4) | GA | ND* | H(WS) | F |
| Remark: * | Applies to the sum of these substances. | | | |
| Picloram (CAS No. Not Applicable) | GA | 50* | H(WS) | J |
| Remark: * | Includes: related forms that convert to the organic acid upon acidification to a pH of 2 or less; and esters of the organic acid. | | | |
| Polybrominated biphenyls (CAS No. Not Applicable) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to each congener individually. | | | |
| Polychlorinated biphenyls (CAS No. Not Applicable) | A, A-S, AA, AA-S | 0.09* | H(WS) | A |
| | GA | 0.09* | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $1 \times 10^{-6}$* | H(FC) | A |
| | SA, SB, SC, I, SD | $1 \times 10^{-6}$* | H(FC) | A |
| | A, A-S, AA, AA-S, B, C, D | $1.2 \times 10^{-4}$* | W | |
| | SA, SB, SC, I, SD | $1.2 \times 10^{-4}$* | W | |
| Remark: * | Applies to the sum of these substances. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Principal organic contaminant (CAS No. Not Applicable) | GA | 5 | H(WS) | J |

Remarks: This standard applies to any and every individual substance, whether listed in this Table or not, that is in one of the principal organic contaminant classes as defined in section 700.1 of this Title except any substance that has a H(WS) Type standard for class GA waters (other than 5 ug/L with Basic Code J) listed elsewhere in this Table.

For the convenience of the reader, the principal organic contaminant standard of 5 ug/L (Basic Code J), is listed in this Table for some but not all substances regulated by this standard.

A less stringent guidance value for an individual substance may be substituted for this standard if so determined by the Commissioner of the New York State Department of Health.

| | | | | |
|---|---|---|---|---|
| Prometon (1610-18-0) | GA | 50 | H(WS) | J |
| Propachlor (1918-16-7) | GA | 35 | H(WS) | F |
| Propanil (709-98-8) | GA | 7.0 | H(WS) | F |
| Propazine (139-40-2) | GA | 16 | H(WS) | F |
| Propham (122-42-9) | GA | 50 | H(WS) | J |
| n-Propylbenzene (103-65-1) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |

Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance.

| | | | |
|---|---|---|---|
| Quaternary ammonium compounds (including dimethyl benzyl ammonium chloride and dimethyl ethyl benzyl ammonium chloride) (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | 10* | A(C) |

Remarks: * Applies to the sum of these substances.

* For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title.

| | | | | |
|---|---|---|---|---|
| Radium 226 (CAS No. Not Applicable) | A, AA | * | H(WS) | H |
| | GA | * | H(WS) | H |

Remark: * 3 picocuries per liter; also see standards for "Radium 226 and Radium 228."

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Radium 226 and | A, A-S, AA, AA-S | * | H(WS) | G |
| Radium 228 | GA | * | H(WS) | G |
| (CAS No. Not Applicable) | | | | |
| Remark: * 5 picocuries per liter; Applies to the sum of these substances. | | | | |
| Radium 228 | A, A-S, AA, AA-S | * | H(WS) | |
| (CAS No. | GA | * | H(WS) | |
| Not Applicable) | | | | |
| Remark: * Refer to standards for "Radium 226 and Radium 228." | | | | |
| Selenium | A, A-S, AA, AA-S | 10 | H(WS) | G |
| (CAS No. | GA | 10 | H(WS) | G |
| Not Applicable) | A, A-S, AA, AA-S, B, C | 4.6* | A(C) | |
| Remark: * Aquatic Type standard applies to dissolved form. | | | | |
| Silver | A, A-S, AA, AA-S | 50 | H(WS) | G |
| (CAS No. | GA | 50 | H(WS) | F |
| Not Applicable) | A, A-S, AA, AA-S, B, C | 0.1* | A(C) | |
| | D | ** | A(A) | |
| | SD | 2.3 | A(A) | |
| Remarks: * Applies to ionic silver. | | | | |
| ** exp(1.72 [ln (ppm hardness)] - 6.52) | | | | |
| Standards for D and SD Classes apply to acid-soluble form. | | | | |
| For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title. | | | | |
| Simazine | A, A-S, AA, AA-S | 0.5 | H(WS) | A |
| (122-34-9) | GA | 0.5 | H(WS) | A |
| Sodium | GA | 20,000 | H(WS) | H |
| (CAS No. Not Applicable) | | | | |
| Strontium 90 | A, A-S, AA, AA-S | * | H(WS) | G |
| (CAS No. Not Applicable) | | | | |
| Remarks: * 8 picocuries per liter. | | | | |
| If two or more radionuclides are present, the sum of their doses shall not exceed an annual potential dose of 4 millirems per year. | | | | |
| Styrene | GA | * | H(WS) | J |
| (100-42-5) | A, A-S, AA, AA-S | 50 | E | U |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Sulfate | A, A-S, AA, AA-S | 250,000 | H(WS) | G |
| (CAS No. | GA | 250,000 | H(WS) | F |
| Not Applicable) | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Sulfite (CAS No. Not Applicable) | A, A-S, AA, AA-S, B, C | 200* | A(C) | |
| Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | | |
| Tebuthiuron (34014-18-1) | GA | 50 | H(WS) | J |
| Terbacil (5902-51-2) | GA | 50 | H(WS) | J |
| Tetrachloro-benzenes (634-66-2; 634-90-2; 95-94-3; 12408-10-5) | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S | 10** | E | U |
| Remarks: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to each isomer (1,2,3,4-, 1,2,3,5-, and 1,2,4,5-tetrachlorobenzene) individually. ** Applies to the sum of 1,2,3,4-, 1,2,3,5-, and 1,2,4,5-tetrachlorobenzene. | | | | |
| 1,1,1,2-Tetrachloroethane (630-20-6) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 1,1,2,2-Tetrachloroethane (79-34-5) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Tetrachloroethene (127-18-4) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Tetrachloroterephthalic acid (2136-79-0) | GA | 50 | H(WS) | J |
| alpha, alpha, alpha, 4-Tetrachloro-toluene (5216-25-1) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Thallium | A, A-S, AA, AA-S, B, C | 8* | A(C) | |
| (CAS No. Not Applicable) | D | 20 | A(A) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. Aquatic Type standards apply to acid-soluble form. | | | |
| Theophylline (58-55-9) | A, A-S, AA, AA-S | 40 | H(WS) | B |
| Thiram (137-26-8) | GA | 1.8 | H(WS) | F |
| Toluene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (108-88-3) | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S, B, C, D | 6,000 | H(FC) | B |
| | SA, SB, SC, I, SD | 6,000 | H(FC) | B |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Toluene-2,4-diamine (95-80-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Toluene-2,5-diamine (95-70-5) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Toluene-2,6-diamine (823-40-5) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| o-Toluidine (95-53-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Toxaphene | A, A-S, AA, AA-S | 0.06 | H(WS) | A |
| (8001-35-2) | GA | 0.06 | H(WS) | A |
| | A, A-S, AA, AA-S, B, C, D | $6 \times 10^{-6}$ | H(FC) | A |
| | SA, SB, SC, I, SD | $6 \times 10^{-6}$ | H(FC) | A |
| | A, A-S, AA, AA-S, B, C | 0.005 | A(C) | |
| | D | 1.6* | A(A) | |
| | SA, SB, SC | 0.005 | A(C) | |
| Remark: * For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic standard if so determined under section 702.15(d) of this Title. | | | | |
| 1,2,4-Tribromobenzene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (615-54-3) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,4,6-Trichloroaniline (634-93-5) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Trichloro- | GA | * | H(WS) | J |
| benzenes | A, A-S, AA, AA-S, B, C | 5** | A(C) | |
| (87-61-6; 120-82-1; | SA, SB, SC | 5** | A(C) | |
| 108-70-3; | A, A-S, AA, AA-S | 10** | E | U |
| 12002-48-1) | D | 50** | E | V |
| | SD | 50** | E | V |
| Remarks: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to each isomer (1,2,3-, 1,2,4- and 1,3,5-trichlorobenzene) individually.<br>** Applies to the sum of 1,2,3-, 1,2,4- and 1,3,5-trichlorobenzene.<br>For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) of this Title. | | | | |
| 1,1,1-Trichloroethane | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (71-55-6) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 1,1,2-Trichloroethane | A, A-S, AA, AA-S | 1 | H(WS) | A |
| (79-00-5) | GA | 1 | H(WS) | A |
| Trichloroethene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (79-01-6) | GA | * | H(WS) | J |
| | A, A-S, AA, AA-S, B, C, D | 40 | H(FC) | A |
| | SA, SB, SC, I, SD | 40 | H(FC) | A |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| Trichlorofluoromethane | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (75-69-4) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,4,5-Trichlorophe- noxyacetic acid (93-76-5) | GA | 35 | H(WS) | F |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 2,4,5-Trichlorophenoxypropionic acid (93-72-1) | A, A-S, AA, AA-S | 10 | H(WS) | G |
| | GA | 0.26 | H(WS) | F |
| 1,1,2-Trichloropropane (598-77-6) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 1,2,3-Trichloropropane (96-18-4) | A, A-S, AA, AA-S | 0.04 | H(WS) | A |
| | GA | 0.04 | H(WS) | A |
| cis-1,2,3-Trichloropropene (13116-57-9) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| trans-1,2,3-Trichloropropene (13116-58-0) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| alpha,2,4-Trichlorotoluene (94-99-5) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| alpha,2,6-Trichlorotoluene (2014-83-7) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| alpha,3,4-Trichlorotoluene (102-47-6) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| alpha,alpha,2-Trichlorotoluene (88-66-4) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| alpha,alpha,4-Trichlorotoluene (13940-94-8) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |
| 2,3,4-Trichlorotoluene (7359-72-0) | GA | * | H(WS) | J |
| Remark: * The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| 2,3,5-Trichlorotoluene (56961-86-5) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,3,6-Trichlorotoluene (2077-46-5) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,4,5-Trichlorotoluene (6639-30-1) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,4,6-Trichlorotoluene (23749-65-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,1,1-Trichloro-2,2,2-trifluoroethane (354-58-5) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (76-13-1) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Trifluralin (1582-09-8) | GA | 35 | H(WS) | F |
| 1,2,3-Trimethyl-benzene (526-73-8) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,2,4-Trimethyl-benzene (95-63-6) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,3,5-Trimethyl-benzene (108-67-8) | A, A-S, AA, AA-S | 5 | H(WS) | I |
| | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| sym-Trinitrobenzene (99-35-4) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,3,4-Trinitrotoluene (602-29-9) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,3,6-Trinitrotoluene (18292-97-2) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,4,5-Trinitrotoluene (610-25-3) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 2,4,6-Trinitrotoluene (118-96-7) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 3,4,5-Trinitrotoluene (603-15-6) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Triphenyl phosphate (115-86-6) | A, A-S, AA, AA-S, B, C<br>D | 4*<br>40* | A(C)<br>A(A) | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title. | | | |
| Tritium (CAS No. Not Applicable) | A, A-S, AA, AA-S | * | H(WS) | G |
| Remark: * | 20,000 picocuries per liter; if two or more radionuclides are present, the sum of their annual dose equivalent to the total body or any organ shall not exceed 4 millirems per year. | | | |
| Uranyl ion (CAS No. Not Applicable) | GA | 5,000 | H(WS) | H |

| SUBSTANCE (CAS NO.) | WATER CLASSES | STANDARD (ug/L) | TYPE | BASIS CODE |
|---|---|---|---|---|
| Vanadium | A, A-S, AA, AA-S, B, C | 14* | A(C) | |
| (CAS No. | D | 190* | A(A) | |
| Not Applicable) | | | | |
| Remark: * | For the waters of the Great Lakes System, the department will substitute a guidance value for the aquatic Type standard if so determined under section 702.15(c) and (d) of this Title. Aquatic Type standards apply to acid-soluble form. | | | |
| Vinyl chloride | GA | 2 | H(WS) | G |
| (75-01-4) | | | | |
| 1,2-Xylene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (95-47-6) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,3-Xylene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (108-38-3) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| 1,4-Xylene | A, A-S, AA, AA-S | 5 | H(WS) | I |
| (106-42-3) | GA | * | H(WS) | J |
| Remark: * | The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in this Table) applies to this substance. | | | |
| Zinc | A, A-S, AA, AA-S, B, C | * | A(C) | |
| (CAS No. | A, A-S, AA, AA-S, B, C, D | ** | A(A) | |
| Not Applicable) | SA, SB, SC, I | 66 | A(C) | |
| | SD | 95 | A(A) | |
| Remarks: | Aquatic Type standards apply to dissolved form.<br>* exp(0.85 [ln(ppm hardness)] + 0.50)<br>** 0.978 exp(0.8473 [ln(ppm hardness)] + 0.884) | | | |
| Zineb | GA | 1.8 | H(WS) | F |
| (12122-67-7) | | | | |
| Ziram | GA | 4.2 | H(WS) | F |
| (137-30-4) | | | | |

**Table 2**

BASIS OF STANDARDS

(*cf. section 703.5*)

| BASIS CODE | BASIS |
|---|---|
| A | Oncogenic, Human Health |
| B | Non-oncogenic, Human Health |
| F | Former Groundwater Regulations, 6 NYCRR § 703.5(a)(3), Human Health or Aesthetics |
| G | Specific MCL, Human Health or Aesthetics |
| H | Former Use of or Reference to 10 NYCRR Part 170, Human Health or Aesthetics |
| I | Principal Organic Contaminant Classes, Human Health |
| J | Former Groundwater Reference to 10 NYCRR Subpart 5-1, General Standards, Human Health |
| U | Potable Water, Aesthetics |
| V | Aquatic Life, Aesthetics |

**Historical Note**

Sec. filed March 20, 1967; repealed, new filed: April 28, 1972; Aug. 2, 1978; amd. filed Nov. 5, 1984; repealed, new filed Aug. 2, 1991; amds. filed: Dec. 10, 1993; Feb. 10, 1998; March 22, 1999 eff. April 7, 1999. Amended (f), Table (1).

## § 703.6 Groundwater effluent limitations for discharges to Class GA waters.

(a) The groundwater effluent limitations in Table 3 of subdivision (e) of this section and effluent limitations as established by section 702.16(c)(1) of this Title apply to a discharge from a point source or outlet or any other discharge within the meaning of the Environmental Conservation Law, section 17-0501 that will or may enter the waters of the State. Unless a demonstration is made to the contrary, it shall be presumed that a discharge to the ground or unsaturated zone is a discharge to groundwater. The groundwater effluent limitation is the maximum allowable concentration in micrograms per liter (ug/L), unless otherwise noted.

(b) In addition to the chemical characteristics provided in subdivision (a) of this section, coliform or pathogenic organisms shall not be discharged in amounts sufficient to render groundwaters detrimental to public health, safety or welfare.

(c) The department may establish additional groundwater effluent limitations as set forth in Part 702 of this Title.

(d) The groundwater effluent limitations shall be incorporated in SPDES permits (under Part 750 *et seq.* of this Title) for discharges to groundwaters, where applicable.

(e) *Tables.*

Table 3
(*cf. section 703.6*)

GROUNDWATER EFFLUENT LIMITATIONS
CLASS GA

| SUBSTANCE | CAS NO. | MAXIMUM ALLOWABLE CONCENTRATION (ug/L) |
|---|---|---|
| Alachlor | 15972-60-8 | 0.5 |
| Aldicarb and Methomyl | 116-06-3; 16752-77-5 | 0.35 |
| Aldrin | 309-00-2 | Not Detectable |
| Aluminum | Not Applicable | 2,000 |
| Antimony | Not Applicable | 6 |
| Arsenic | Not Applicable | 50 |
| Asbestos (fibers>10um) | Not Applicable | $1.4 \times 10^7$(fibers/L) |
| Atrazine | 1912-24-9 | 7.5 |
| Azinphosmethyl | 86-50-0 | 4.4 |
| Barium | Not Applicable | 2,000 |
| Benefin | 1861-40-1 | 35 |
| Benzene | 71-43-2 | 1 |
| Benzo(a)pyrene | 50-32-8 | Not Detectable |
| Bis(2-chloroethyl)ether | 111-44-4 | 1.0 |
| bis(2-ethylhexyl)phthalate | 117-81-7 | 5 |
| Bromacil | 314-40-9 | 4.4 |
| Butachlor | 23184-66-9 | 3.5 |
| Cadmium | Not Applicable | 10 |
| Captan | 133-06-2 | 18 |
| Carbaryl | 63-25-2 | 29 |
| Carbon tetrachloride | 56-23-5 | 5 |
| Chlorinated dibenzo-p-dioxins and Chlorinated dibenzofurans[7] | Not Applicable | $7 \times 10^{-7}$ equivalents of 2, 3, 7, 8 - TCDD |
| Chloramben[1] | Not Applicable | 50 |
| Chlordane | 57-74-9 | 0.05 |
| Chloride | Not Applicable | 500,000 |
| Chloroform | 67-66-3 | 7 |
| Chromium (Hexavalent) | Not Applicable | 100 |
| Copper | Not Applicable | 1,000 |
| Cyanide | Not Applicable | 400 |
| p,p'-DDD | 72-54-8 | 0.3 |
| p,p'-DDE | 72-55-9 | 0.2 |
| p,p'-DDT | 50-29-3 | 0.2 |
| Diazinon | 333-41-5 | 0.7 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | 0.04 |
| Di-n-butylphthalate | 84-74-2 | 50 |
| Dicamba | 1918-00-9 | 0.44 |
| 1,2-Dichlorobenzene | 95-50-1 | 3 |
| 1,3-Dichlorobenzene | 541-73-1 | 3 |
| 1,4-Dichlorobenzene | 106-46-7 | 3 |
| 1,2-Dichloroethane | 107-06-2 | 0.6 |
| 2,4-Dichlorophenoxyacetic acid (2,4-D) | 94-75-7 | 50 |
| 1,2-Dichloropropane | 78-87-5 | 1 |

| SUBSTANCE | CAS NO. | MAXIMUM ALLOWABLE CONCENTRATION (ug/L) |
|---|---|---|
| 1,3-Dichloropropene (sum of cis- and trans- isomers) | 542-75-6 (sum of 10061-01-5 and 10061-02-6) | 0.4 |
| Dieldrin | 60-57-1 | 0.004 |
| Di(2-ethylhexyl)adipate | 103-23-1 | 20 |
| N,N-Dimethylaniline | 121-69-7 | 1 |
| Diphenylhydrazine | 122-66-7 | Not Detectable |
| Diquat | 2764-72-9 | 20 |
| Endrin | 72-20-8 | Not Detectable |
| Ethylene dibromide | 106-93-4 | $6 \times 10^{-4}$ |
| Ethylenethiourea | 96-45-7 | Not Detectable |
| Ferbam | 14484-64-1 | 4.2 |
| Fluoride | Not Applicable | 3,000 |
| Foaming agents[2] | Not Applicable | 1,000 |
| Folpet | 133-07-3 | 50 |
| Heptachlor | 76-44-8 | 0.04 |
| Heptachlor epoxide | 1024-57-3 | 0.03 |
| Hexachlorobenzene | 118-74-1 | 0.04 |
| Hexachlorobutadiene | 87-68-3 | 0.5 |
| alpha-Hexachlorocyclohexane | 319-84-6 | 0.01 |
| beta-Hexachlorocyclohexane | 319-85-7 | 0.04 |
| delta-Hexachlorocyclohexane | 319-86-8 | 0.04 |
| epsilon-Hexachlorocyclohexane | 6108-10-7 | 0.04 |
| gamma-Hexachlorocyclohexane | 58-89-9 | 0.05 |
| Hexachlorophene | 70-30-4 | See Note 3 |
| Iron[4] | Not Applicable | 600 |
| Kepone | 143-50-0 | Not Detectable |
| Lead | Not Applicable | 50 |
| Malathion | 121-75-5 | 7.0 |
| Mancozeb | 8018-01-7 | 1.8 |
| Maneb | 12427-38-2 | 1.8 |
| Manganese[4] | Not Applicable | 600 |
| Mercury | Not Applicable | 1.4 |
| Methoxychlor | 72-43-5 | 35 |
| 2-Methyl-4-chlorophenoxyacetic acid | 94-74-6 | 0.44 |
| Methylene chloride (Dichloromethane) | 75-09-2 | 5 |
| Methyl methacrylate | 80-62-6 | 50 |
| Mirex | 2385-85-5 | 0.03 |
| Nabam | 142-59-6 | 1.8 |
| Nickel | Not Applicable | 200 |
| Nitralin | 4726-14-1 | 35 |
| Nitrate (expressed as N) | Not Applicable | 20,000 |
| Nitrate and Nitrite (expressed as N) | Not Applicable | 20,000 |
| Nitrilotriacetic acid[5] | Not Applicable | 3 |
| Nitrite (expressed as N) | Not Applicable | 2,000 |
| Nitrobenzene | 98-95-3 | 0.4 |
| Octachlorostyrene | 29082-74-4 | 0.2 |
| Oil and Grease | Not Applicable | 15,000 |
| Paraquat | 4685-14-7 | 3.0 |

| SUBSTANCE | CAS NO. | MAXIMUM ALLOWABLE CONCENTRATION (ug/L) |
|---|---|---|
| Parathion and Methyl parathion | 56-38-2; 298-00-0 | 1.5 |
| Pentachloronitrobenzene | 82-68-8 | Not Detectable |
| pH | Not Applicable | See Note 6 |
| Phenolic compounds (total phenols) | Not Applicable | 2 |
| Phorate and Disulfoton | 298-02-2; 298-04-4 | Not Detectable |
| Polychlorinated biphenyls | Not Applicable | 0.09 |
| Propachlor | 1918-16-7 | 35 |
| Propanil | 709-98-8 | 7.0 |
| Propazine | 139-40-1 | 16 |
| Selenium | Not Applicable | 20 |
| Silver | Not Applicable | 100 |
| Simazine | 122-34-9 | 0.5 |
| Styrene | 100-42-5 | 930 |
| Sulfate | Not Applicable | 500,000 |
| Sulfide | Not Applicable | 1,000 |
| Thiram | 137-26-8 | 1.8 |
| Toxaphene | 8001-35-2 | 0.06 |
| 1,1,2-Trichloroethane | 79-00-5 | 1 |
| Trichloroethene | 79-01-6 | 5 |
| 2,4,5-Trichlorophenoxyacetic acid | 93-76-5 | 35 |
| 2,4,5-Trichlorophenoxypropionic acid | 93-72-1 | 0.26 |
| 1,2,3-Trichloropropane | 96-18-4 | 0.04 |
| Trifluralin | 1582-09-8 | 35 |
| Vinyl chloride | 75-01-4 | 2 |
| Zinc | Not Applicable | 5,000 |
| Zineb | 12112-67-7 | 1.8 |
| Ziram | 137-30-4 | 4.2 |

1. Includes related forms that convert to the organic acid upon acidification to a pH of 2 or less; and esters of the organic acid.

2. Foaming agents determined as methylene blue active substances (MBAS) or other tests as specified by the commissioner.

3. Refer to groundwater effluent limitation for "Phenolic compounds (total phenols)".

4. Combined concentration of iron and manganese shall not exceed 1000 ug/L.

5. Includes related forms that convert to nitrilotriacetic acid upon acidification to a pH of 2.3 or less.

6. pH shall not be lower than 6.5 or the pH of the natural groundwater, whichever is lower, nor shall be greater than 8.5 or the pH of the natural groundwater, whichever is greater.

7. Value is for the total of the chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans as equivalents of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) as specified by the Class GA H(WS) standard in Table 1 of section 703.5 of this Part.

In addition to the effluent limitations above, the following also apply in the counties of Nassau and Suffolk:

| SUBSTANCE | MAXIMUM ALLOWABLE CONCENTRATION IN mg/L |
|---|---|
| (1) Dissolved solids, total | 1,000 |
| (2) Nitrogen, total (as N) | 10 |

**Historical Note**

Sec. filed Aug. 2, 1978; repealed, new filed Aug. 2, 1991; amds. filed: Feb. 10, 1998; March 3, 1998; March 22, 1999 eff April 7, 1999. Amended (e), (Table 3).

## § 703.7 Severability.

If any provision of this Part or its application to any person or circumstance is held to be invalid, the remainder of this Part and the application of that provision to other persons or circumstances will not be affected.

**Historical Note**

Sec. filed Aug. 2, 1978; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

## § 703.8-703.11

**Historical Note**

Secs. filed Aug. 2, 1978; repealed, filed Aug. 2, 1991 eff. 30 days after filing.

# PART 704

## CRITERIA GOVERNING THERMAL DISCHARGES

(Statutory authority: Environmental Conservation Law, §§15-0313, 17-0301)

Sec.



**Historical Note**

Part (§§704.1-704.4) filed Aug. 12, 1969; repealed, new filed: April 28, 1972; Sept. 20, 1974 eff. 30 days after filing with the Secretary of State, provided, however, if the application, pursuant to Parts 800 to 941 inclusive of Title 6, of any provision of Part 704 shall be found to be invalid, the corresponding provision of Part 704 in effect immediately prior to such effective date shall be deemed not to have been repealed and shall remain in effect until such time as the provision, the application of which was found to be invalid, can lawfully be made applicable.

### § 704.1 Water quality standards for thermal discharges.

(a) All thermal discharges to the waters of the State shall assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water.

(b) The criteria contained in this Part shall apply to all thermal discharges and shall be complied with, except as provided in this Part.

**Historical Note**

Sec. filed Aug. 12, 1969; repealed, new filed: April 28, 1972; Sept. 20, 1974 eff. 30 days after filing with the Secretary of State, provided, however, if the application, pursuant to Parts 800 to 941 inclusive of Title 6, of any provision of Part 704 shall be found to be invalid, the corresponding provision of Part 704 in effect immediately prior to such effective date shall be deemed not to have been repealed and shall remain in effect until such time as the provision, the application of which was found to be invalid, can lawfully be made applicable.

### § 704.2 Criteria governing thermal discharges.

(a) *General criteria.* The following criteria shall apply to all waters of the State receiving thermal discharges, except as provided in section 704.6 of this Part:

(1) The natural seasonal cycle shall be retained.

(2) Annual spring and fall temperature changes shall be gradual.

(3) Large day-to-day temperature fluctuations due to heat of artificial origin shall be avoided.

(4) Development or growth of nuisance organisms shall not occur in contravention of water quality standards.

(5) Discharges which would lower receiving water temperature shall not cause a violation of water quality standards and section 704.3 of this Part.

(6) For the protection of the aquatic biota from severe temperature changes, routine shut down of an entire thermal discharge at any site shall not be scheduled during the period from December through March.

(b) *Special criteria.* The following criteria shall apply to all waters of the State receiving thermal discharges, except as provided in section 704.6 of this Part:

(1) Nontrout waters. (i) The water temperature at the surface of a stream shall not be raised to more than 90 degrees Fahrenheit at any point.

(ii) At least 50 percent of the cross sectional area and/or volume of flow of the stream including a minimum of one-third of the surface as measured from shore to shore shall not be raised to more than five Fahrenheit degrees over the temperature that existed before the addition of heat of artificial origin or to a maximum of 86 degrees Fahrenheit whichever is less.

(iii) At least 50 percent of the cross sectional area and/or volume of flow of the stream including a minimum of one-third of the surface as measured from shore to shore shall not be lowered more than five Fahrenheit degrees from the temperature that existed immediately prior to such lowering.

(2) Trout waters. (i) No discharge at a temperature over 70 degrees Fahrenheit shall be permitted at any time to streams classified for trout.

(ii) From June through September no discharge shall be permitted that will raise the temperature of the stream more than two Fahrenheit degrees over that which existed before the addition of heat of artificial origin.

(iii) From October through May no discharge shall be permitted that will raise the temperature of the stream more than five Fahrenheit degrees over that which existed before the addition of heat of artificial origin or to a maximum of 50 degrees Fahrenheit whichever is less.

(iv) From June through September no discharge shall be permitted that will lower the temperature of the stream more than two Fahrenheit degrees from that which existed immediately prior to such lowering.

(3) Lakes. (i) The water temperature at the surface of a lake shall not be raised more than three Fahrenheit degrees over the temperature that existed before the addition of heat of artificial origin.

(ii) In lakes subject to stratification as defined in Part 652 of this Title, thermal discharges that will raise the temperature of the receiving waters shall be confined to the epilimnion.

(iii) In lakes subject to stratification as defined in Part 652 of this Title, thermal discharges that will lower the temperature of the receiving waters shall be discharged to the hypolimnion and shall meet the water quality standards contained in Part 703 of this Title in all respects.

(4) Coastal waters. (i) The water temperature at the surface of coastal waters shall not be raised more than four Fahrenheit degrees from October through June nor more than 1.5 Fahrenheit degrees from July through September over that which existed before the addition of heat of artificial origin.

(ii) The water temperature at the surface of coastal waters shall not be lowered more than four Fahrenheit degrees from October through June nor more than 1.5 Fahrenheit degrees from July through September from that which existed immediately prior to such lowering.

(5) Estuaries or portions of estuaries. (i) The water temperature at the surface of an estuary shall not be raised to more than 90 degrees Fahrenheit at any point.

(ii) At least 50 percent of the cross sectional area and/or volume of the flow of the estuary including a minimum of one-third of the surface as measured from water edge to water edge at any stage of tide, shall not be raised to more than four Fahrenheit degrees over the temperature that existed before the addition of heat of artificial origin or a maximum of 83 degrees Fahrenheit whichever is less.

(iii) From July through September, if the water temperature at the surface of an estuary before the addition of heat of artificial origin is more than 83 degrees Fahrenheit an increase in temperature not to exceed 1.5 Fahrenheit degrees at any point of the estuarine passageway as delineated above, may be permitted.

(iv) At least 50 percent of the cross sectional area and/or volume of the flow of the estuary including a minimum of one-third of the surface as measured from water edge to water edge at any stage of tide, shall not be lowered more than four Fahrenheit degrees from the temperature that existed immediately prior to such lowering.

(6) Enclosed bays. No additional temperature change except that which occurs naturally shall be permitted in enclosed bays.

**Historical Note**

Sec. filed Aug. 12, 1969; repealed, new filed: April 28, 1972; Sept. 20, 1974 eff. 30 days after filing with the Secretary of State, provided, however, if the application, pursuant to Parts 800 to 941 inclusive of Title 6, of any provision of Part 704 shall be found to be invalid, the corresponding provision of Part 704 in effect immediately prior to such effective date shall be deemed not to have been repealed and shall remain in effect until such time as the provision, the application of which was found to be invalid, can lawfully be made applicable. Amd. filed Aug. 2, 1991 eff. 30 days after filing. Amended (b)(3)(iii).

## § 704.3 Mixing zone criteria.

The following criteria shall apply to all waters of the State receiving thermal discharges, except as provided in section 704.6 of this Part.

(a) The department shall specify definable, numerical limits for all mixing zones (*e.g.*, linear distances from the point of discharge, surface area involvement, or volume of receiving water entrained in the thermal plume).

(b) Conditions in the mixing zone shall not be lethal in contravention of water quality standards to aquatic biota which may enter the zone.

(c) The location of mixing zones for thermal discharges shall not interfere with spawning areas, nursery areas and fish migration routes.

**Historical Note**

Sec. filed Aug. 12, 1969, repealed, new filed: April 28, 1972; Sept. 20, 1974 eff. 30 days after filing with the Secretary of State, provided, however, if the application, pursuant to Parts 800 to 941 inclusive of Title 6, of any provision of Part 704 shall be found to be invalid, the corresponding provision of Part 704 in effect immediately prior to such effective date shall be deemed not to have been repealed and shall remain in effect until such time as the provision, the application of which was found to be invalid, can lawfully be made applicable.

## § 704.4 Additional limitations or modifications.

(a) An applicant may apply for a modification of the criteria set forth in sections 704.2 and 704.3 of this Part.

(b) Upon receipt of such application, the commissioner shall confer with the U.S. Environmental Protection Agency and shall transmit to that agency information to enable the administrator to fulfill responsibilities under Federal Law.

(c) The applicant shall have the burden of establishing to the satisfaction of the commissioner that one or more of the criteria are unnecessarily restrictive as to a particular project in that a modification of such criterion, or criteria, as the case may be, would assure the protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made.

(d) The applicant shall consult with the Department of Environmental Conservation to determine appropriate studies which shall be conducted by the applicant. Prior approval shall be obtained by the applicant for a program of studies that will determine the impact of any proposed modification. Such studies shall include, but shall not be limited to:

(1) A comparative analysis of environmental effects of the thermal discharge on the receiving waters when subject to the stated criteria of this Part, and when subject to the applicant's proposed modification.

(2) An analysis of the different discharge modes (*e.g.*, surface or subsurface) and the advantages and disadvantages of each mode with regard to effects on aquatic life.

(e) A public hearing shall be held upon the application.

(f) The commissioner may authorize a modification of the stated criteria, which modifications shall be conditioned upon post-operational experience. The commissioner may require additional treatment of, or change in, a thermal discharge in the event that post-operational experience shows a trend toward impairment by the discharge of the quality of the receiving waters for the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on the body of water.

**Historical Note**

Sec. filed Aug. 12, 1969; repealed, new filed: April 28, 1972; Sept. 20, 1974 eff. 30 days after filing.

## § 704.5 Intake structures.

The location, design, construction and capacity of cooling water intake structures, in connection with point source thermal discharges, shall reflect the best technology available for minimizing adverse environmental impact.

**Historical Note**

Sec. filed Sept. 20, 1974 eff. 30 days after filing.

## § 704.6 Applicability of criteria.

(a) In determining that a discharge existing prior to July 25, 1969 has violated the standard for thermal discharges, as provided in section 704.1(a) of this Part, the violation of any of the criteria contained in this Part shall not constitute evidence of a violation of such standard unless it is also shown that the violation of such criteria has contributed to the violation of the standard.

(b) The provisions of subdivision (a), subparagraphs (1)(iii), (2)(iv), (3)(iii), (4)(ii), (5)(iv), and paragraph (b)(6) of section 704.2 of this Part, and section 704.3, shall apply only to thermal discharges which have been brought into existence subsequent to July 31, 1973, or to which the criteria contained in this Part were intended to apply pursuant to any certification issued by the commissioner pursuant to section 401(d) of the Federal Water Pollution Control Act amendments of 1972.

(c) Whenever the commissioner has reason to believe that a thermal discharge, existing prior to the adoption of this Part, does not conform to section 704.1(a) of this Part, he may impose appropriate criteria contained in this Part upon such thermal discharge, unless, after public hearing, the owner or operator of any such thermal discharge establishes to the satisfaction of the commissioner that either such thermal discharge does conform to such subdivision (a) or that any such criteria are more stringent than necessary to assure conformance with such subdivision (a).

**Historical Note**

Sec. filed Sept. 20, 1974 eff. 30 days after filing.

## § 704.7 Severability.

If any provision of this Part or its application to any person or circumstance is held to be invalid, the remainder of this Part and the application of that provision to other persons or circumstances will not be affected.

**Historical Note**

Sec. filed Aug. 2, 1991 eff. 30 days after filing.

# PART 705

## REFERENCES

(Statutory authority: Environmental Conservation Law, §§ 3-0301[2][m], 15-0313, 17-0301)

Sec.



**Historical Note**

Part (§§ 705.1-705.3) filed Nov. 5, 1984 eff. Nov. 5, 1984.

### § 705.1 Federal statutes or regulations.

The following Federal statutes or regulations have been referenced in Parts 700-704 of this Title:

(a) *40 CFR Part 136* means Part 136 of title 40 of the *Code of Federal Regulations,* as of July 1, 1988 (Protection of the Environment).

(b) The Federal Water Pollution Control Act of 1972, 33 USC 466 *et seq.,* effective October 18, 1972.

(c) All United States publications referenced above are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

**Historical Note**

Sec. filed Nov. 5, 1984; amd. filed Aug. 2, 1991 eff. 30 days after filing.

### § 705.2

**Historical Note**

Sec. filed Nov. 5, 1984; repealed, new filed Aug. 2, 1991; repealed, filed Feb. 10, 1998 eff. 30 days after filing.

### § 705.3 Availability.

All material referenced in Parts 700-704 of this Title is available for copying and inspection at the Department of Environmental Conservation, Division of Water, 50 Wolf Road, Albany, NY 12233.

**Historical Note**

Sec. filed Nov. 5, 1984 eff. Nov. 5, 1984.

### § 705.4 Severability.

If any provision of this Part or its application to any person or circumstance is held to be invalid, the remainder of this Part and the application of that provision to other persons or circumstances will not be affected.

**Historical Note**

Sec. filed Aug. 2, 1991 eff. 30 days after filing.

# PART 706

## APPENDICES FOR PARTS 700-705

(Statutory authority: Environmental Conservation Law, § 17-0301)

Sec.



**Historical Note**

Part (§§ 706.1-706.2) filed Feb. 10, 1998 eff. 30 days after filing.

## § 706.1 Appendix for section 702.9.

### AQUATIC LIFE PROCEDURES

### I. INTRODUCTION

A. This Appendix provides procedures to derive standards and guidance values to protect aquatic life from acute and chronic effects. Tier I procedures, sections III through XI, are used where the required data described in section III.B for freshwater species or section III.C for saltwater species are available. Tier II procedures, sections XII through XVI, are used where the data requirements in sections III.B or III.C are not met.

### II. APPLICABILITY

A. These procedures will generally be used to derive statewide standards or guidance values according to the classified uses described in section 702.9 of this Title. Site-specific modifications to such statewide standards or guidance values are required or allowed as described below.

B. Site-specific modifications to chronic or acute aquatic life values may be developed where:

(1) The local water quality characteristics such as pH, hardness, temperature, color, etc., alter the biological availability or toxicity of a pollutant; or

(2) The sensitivity of the aquatic organisms species that occur at the site differs from the species actually tested in developing the criteria. The phrase *occur at the site* includes the species, genera, families, orders, classes, and phyla that: are usually present at the site; are present at the site only seasonally due to migration; are present intermittently because they periodically return to or extend their ranges into the site; were present at the site in the past, are not currently present at the site due to degraded conditions, and are expected to return to the site when conditions improve; are present in nearby bodies of water, are not currently present at the site due to degraded conditions, and are expected to be present at the site when conditions improve. The taxa that occur at the site cannot be determined merely by sampling downstream and/or upstream of the site at one point in time. *Occur at the site* does not include taxa that were once present at the site but cannot exist at the site now due to permanent physical alteration of the habitat at the site resulting, for example, from dams, etc.

C. Site-specific modifications also may be developed to acute and chronic aquatic life values to reflect local physical and hydrological conditions.

D. Endangered species considerations.

(1) Any site-specific modifications that result in less stringent values must not be likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of such species' critical habitat.

(2) More stringent modifications shall be developed to protect endangered or threatened species where such modifications are necessary to ensure that water quality is not likely to jeopardize the continued existence of such species or result in the destruction or adverse modification of such species' critical habitat.

**Procedures for Deriving Aquatic Life Tier I Standards and Guidance Values; Sections III-XI**

## III. REQUIRED DATA

A. Certain data should be available to help ensure that each of the major kinds of possible adverse effects receive adequate consideration.

B. To derive an acute or chronic standard or guidance value for freshwater aquatic organisms and their uses, the following must be available:

1. Results of acceptable acute tests (see section IV or VI of this Appendix) with at least one species of freshwater animal in at least eight different families such that all of the following are included:

a. The family Salmonidae in the class Osteichthyes;

b. One other family (preferably a commercially or recreationally important, warmwater species) in the class Osteichthyes (*e.g.*, bluegill, channel catfish);

c. A third family in the phylum Chordata (*e.g.*, fish, amphibian);

d. A planktonic crustacean (*e.g.*, a cladoceran, copepod);

e. A benthic crustacean (*e.g.*, ostracod, isopod, amphipod, crayfish);

f. An insect (*e.g.*, mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge);

g. A family in a phylum other than Arthropoda or Chordata (*e.g.*, Rotifera, Annelida, Mollusca);

h. A family in any order of insect or any phylum not already represented.

2. Acute-chronic ratios (see section VI of this Appendix) with at least one species of aquatic animal in at least three different families provided that of the three species:

a. At least one is a fish;

b. At least one is an invertebrate; and

c. At least one species is an acutely sensitive freshwater species (the other two may be saltwater species).

3. Results of at least one acceptable test with a freshwater alga or vascular plant is desirable but not required for standard or guidance value derivation (see section VIII of this Appendix). If plants are among the aquatic organisms most sensitive to the material, results of a test with a plant in another phylum (division) should also be available.

C. To derive a standard or guidance value for saltwater aquatic organisms and their uses, the following must be available:

1. Results of acceptable acute tests (see section IV or VI of this Appendix) with at least one species of saltwater animal in at least eight different families such that all of the following are included:

a. two families in the phylum Chordata;

b. a family in a phylum other than Arthropoda or Chordata;

c. either the Mysidae or Penaeidae family;

d. three other families not in the phylum Chordata (may include Mysida or Penaeidae, whichever was not used above);

e. any other family.

2. Acute-chronic ratios (see section VI of this Appendix) with species of aquatic animals in at least three different families provided that of the three species:

a. at least one is a fish;

b. at least one is an invertebrate; and

c. at least one is an acutely sensitive saltwater species (the other two may be freshwater species).

3. Results of at least one acceptable test with a saltwater alga or vascular plant is desirable but not required for standard or guidance value derivation (see section VIII of this Appendix). If plants are among the aquatic organisms most sensitive to the material, results of a test with a plant in another phylum (division) should also be available.

D. If all required data are available, a numerical standard or guidance value can usually be derived except in special cases. For example, derivation of a chronic standard or guidance value might not be possible if the available ACRs vary by more than a factor of 10 with no apparent pattern. Also, if a standard or guidance value is to be related to a water quality characteristic (see sections V and VII of this Appendix), more data will be required.

E. Confidence in a standard or guidance value usually increases as the amount of available pertinent information increases. Thus, additional data are usually desirable.

## IV. FINAL ACUTE VALUE

A. Appropriate measures of the acute (short-term) toxicity of the material to a variety of species of aquatic animals are used to calculate the Final Acute Value (FAV). The Final Acute Value is a calculated estimate of the concentration of a test material such that 95 percent of the genera (with which acceptable acute toxicity tests have been conducted on the material) have higher Genus Mean Acute Values (GMAVs). An acute test is a comparative study in which organisms, that are subjected to different treatments, are observed for a short period usually not constituting a substantial portion of their life span. However, in some cases, the Species Mean Acute Value (SMAV) of a commercially or recreationally important species is lower than the calculated FAV, then the SMAV replaces the calculated FAV in order to provide protection for that important species.

B. Acute toxicity tests shall be conducted using acceptable procedures.

C. Except for results with saltwater annelids and mysids, results of acute tests during which the test organisms were fed should not be used, unless data indicate that the food did not affect the toxicity of the test material.

D. Results of acute tests conducted in unusual dilution water, *e.g.,* dilution water in which total organic carbon or particulate matter exceeded five mg/L, should not be used, unless a relationship is developed between acute toxicity and organic carbon or particulate matter, or unless data show that organic carbon or particulate matter, etc., do not affect toxicity.

E. Acute values must be based upon endpoints which reflect the total severe adverse impact of the test material on the organisms used in the test. Therefore, only the following kinds of data on acute toxicity to aquatic animals shall be used:

1. Tests with daphnids and other cladocerans must be started with organisms less than 24 hours old and tests with midges must be started with second or third instar larvae. It is preferred that the results should be the 48-hour EC50 based on the total percentage of organism killed and immobilized. If such an EC50 is not available for a test, the 48-hour LC50 should be used in place of the desired 48-hour EC50. An EC50 or LC50 of longer than 48 hours can be used as long as the animals were not fed and the control animals were acceptable at the end of the test. An EC50 is a statistically or graphically estimated concentration that is expected to cause one or more specified effects in 50 percent of a group of organisms under specified conditions. An LC50 is a statistically or graphically estimated concentration that is expected to be lethal to 50 percent of a group of organisms under specified conditions.

2. It is preferred that the results of a test with embryos and larvae of barnacles, bivalve molluscs (clams, mussels, oysters and scallops), sea urchins, lobsters, crabs, shrimp and abalones be the 96-hour EC50 based on the percentage of organisms with incompletely developed shells plus the percentage of organisms killed. If such an EC50 is not available from a test, of the values that are available from the test, the lowest of the following should be used in place of the desired 96-hour EC50: 48- to 96-hour EC50s based on percentage of organisms with incompletely developed shells plus percentage of organisms killed, 48- to 96-hour EC50s based on percentage of organisms with incompletely developed shells, and 48-hour to 96-hour LC50s.

3. It is preferred that the result of tests with all other aquatic animal species and older life stages of barnacles, bivalve molluscs (clams, mussels, oysters and scallops), sea urchins, lobsters, crabs, shrimp and abalones be the 96-hour EC50 based on percentage of organisms exhibiting loss of equilibrium plus percentage of organisms immobilized plus percentage of organisms killed. If such an EC50 is not available from a test, of the values that are available from a test the lower of the following should be used in place of the desired 96-hour EC50: the 96-hour EC50 based on percentage of organisms exhibiting loss of equilibrium plus percentage of organisms immobilized and the 96-hour LC50.

4. Tests whose results take into account the number of young produced, such as most tests with protozoans, are not considered acute tests, even if the duration was 96 hours or less.

5. If the tests were conducted properly, acute values reported as "greater than" values and those which are above the solubility of the test material should be used, because rejection of such acute values would bias the Final Acute Value by eliminating acute values for resistant species.

F. If the acute toxicity of the material to aquatic animals has been shown to be related to a water quality characteristic such as hardness or particulate matter for freshwater animals, refer to section V of this Appendix.

G. The agreement of the data within and between species must be considered. Acute values that appear to be questionable in comparison with other acute and chronic data for the same species and for other species in the same genus must not be used. For example, if the acute values available for a species or genus differ by more than a factor of 10, rejection of some or all of the values would be appropriate, absent countervailing circumstances.

H. If the available data indicate that one or more life stages are at least a factor of two more resistant than one or more other life stages of the same species, the data for the more resistant life stages must not be used in the calculation of the SMAV because a species cannot be considered protected from acute toxicity if all of the life stages are not protected.

I. For each species for which at least one acute value is available, the SMAV shall be calculated as the geometric mean of the results of all acceptable flow-through acute toxicity tests in which the concentrations of test material were measured with the most sensitive tested life stage of the species. For a species for which no such result is available, the SMAV shall be calculated as the geometric mean of all acceptable acute toxicity tests with the most sensitive tested life stage, *i.e.*, results of flow-through tests in which the concentrations were not measured and results of static and renewal tests based on initial concentrations (nominal concentrations are acceptable for most test materials if measured concentrations are not available) of test material. A renewal test is a test with aquatic organisms in which either the test solution in a test chamber is removed and replaced at least once during the test or the test organisms are transferred into a new test solution of the same composition at least once during the test. A static test is a test with aquatic organisms in which the solution and organisms that are in a test chamber at the beginning of the test remain in the chamber until the end of the test, except for removal of dead test organisms.

*Note 1:* Data reported by original investigators must not be rounded off. Results of all intermediate calculations must not be rounded off to fewer than four significant digits.

*Note 2:* The geometric mean of N numbers is the Nth root of the product of the N numbers. Alternatively, the geometric mean can be calculated by adding the logarithms of the N numbers, dividing the sum by N, and taking the antilog of the quotient. The geometric mean of two numbers is the square root of the product of the two numbers, and the geometric mean of one number is that number. Either natural (base e) or common (base 10) logarithms can be used to calculate geometric means as long as they are used consistently within each set of data, *i.e.*, the antilog used must match the logarithms used.

*Note 3:* Geometric means, rather than arithmetic means, are used here because the distributions of sensitivities of individual organisms in toxicity tests on most materials and the distributions of sensitivities of species within a genus are more likely to be lognormal than normal. Similarly, geometric means are used for ACRs because quotients are likely to be closer to lognormal than normal distributions. In addition, division of the geometric mean of a set of numerators by the geometric mean of the set of denominators will result in the geometric mean of the set of corresponding quotients.

J. For each genus for which one or more SMAVs are available, the GMAV shall be calculated as the geometric mean of the SMAVs available for the genus.

K. Order the GMAVs from high to low.

L. Assign ranks, R, to the GMAVs from "1" for the lowest to "N" for the highest. If two or more GMAVs are identical, assign them successive ranks.

M. Calculate the cumulative probability, P, for each GMAV as R/ (N + 1).

N. Select the four GMAVs which have cumulative probabilities closest to 0.05 (if there are fewer than 59 GMAVs, these will always be the four lowest GMAVs)

O. Using the four selected GMAVs, and Ps, calculate

$$S^2 = \frac{\sum((\ln GMAV)^2) - \frac{(\sum(\ln GMAV))^2}{4}}{\sum(P) - \frac{(\sum(\sqrt{P}))^2}{4}}$$

$$L = \frac{\sum(\ln GMAV) - S(\sum(\sqrt{P}))}{4}$$

$$A = S(\sqrt{0.05}) + L$$

$$FAV = e^A$$

P. If for a commercially or recreationally important species the geometric mean of the acute values from flow-through tests in which the concentrations of test material were measured is lower than the calculated Final Acute Value (FAV), then that geometric mean must be used as the FAV instead of the calculated FAV.

Q. See section VI of this Appendix.

## V. FINAL ACUTE EQUATION

A. When enough data are available to show that acute toxicity to two or more species is similarly related to a water quality characteristic, the relationship shall be taken into account as described in sections V.B through V.G of this Appendix or using analysis of covariance. The two methods are equivalent and produce identical results. The manual method described below provides an understanding of this application of covariance analysis, but computerized versions of covariance analysis are much more convenient for analyzing large data sets. If two or more factors affect toxicity, multiple regression analysis shall be used.

B. For each species for which comparable acute toxicity values are available at two or more different values of the water quality characteristic, perform a least squares regression of the acute toxicity values on the corresponding values of the water quality characteristic to obtain the slope and its 95 percent confidence limits for each species.

*Note:* Because the best documented relationship is that between hardness and acute toxicity of metals in fresh water and a log-log relationship fits these data, geometric means and natural logarithms of both toxicity and water quality are used in the rest of this section. For relationships based on other water quality characteristics, such as pH, temperature, no transformation or a different transformation might fit the data better, and appropriate changes will be necessary throughout this section.

C. Decide whether the data for each species are relevant, taking into account the range and number of the tested values of the water quality characteristic and the degree of agreement within and between species. For example, a slope based on six data points might be of limited value if it is based only on data for a very narrow range of values of the water quality characteristic. A slope based on only two data points, however, might be useful it it is consistent with other information and if the two points cover a broad enough range of the water quality characteristic. In addition, acute values that appear to be questionable in comparison with other acute and chronic data available for the same species and for other species in the same genus should not be used. For example, if after adjustment for the water quality characteristic, the acute values available for a species or genus differ by more than a factor of 10, rejection of some or all of the values would be appropriate, absent countervailing justification. If useful slopes are not available for at least one fish and one invertebrate or if the available slopes are too dissimilar or if too few data are available to adequately define the relationship between acute toxicity and the water quality characteristic, return to section IV.G of this Appendix, using the results of tests conducted under conditions and in waters similar to those commonly used for toxicity tests with the species.

D. For each species, calculate the geometric mean of the available acute values and then divide each of the acute values for the species by the geometric mean for the species. This normalizes the acute values so that the geometric mean of the normalized values for each species individually and for any combination of species is 1.0.

E. Similarly normalize the values of the water quality characteristic for each species individually using the same procedure as above.

F. Individually for each species perform a least squares regression of the normalized acute values of the water quality characteristic. The resulting slopes and 95 percent confidence limits will be identical to those obtained in section V.B. of this Appendix. If, however, the data are actually plotted, the line of best fit for each individual species will go through the point 1,1 in the center of the graph.

G. Treat all of the normalized data as if they were all for the same species and perform a least squares regression of all of the normalized acute values on the corresponding normalized values of the water quality characteristic to obtain the pooled acute slope, V, and its 95 percent confidence limits. If all of the normalized data are actually plotted, the line of best fit will go through the point 1,1 in the center of the graph.

H. For each species calculate the geometric mean, W, of the acute toxicity values and the geometric mean, X, of the values of the water quality characteristic. (These were calculated in sections V.D and V.E of this Appendix).

I. For each species, calculate the logarithm, Y, of the SMAV at a selected value, Z, of the water quality characteristic using the equation:

$$Y = \ln W - V(\ln X - \ln Z)$$

J. For each species calculate the SMAV at X using the equation:

$$SMAV = \exp(y)$$

*Note:* Alternatively, the SMAVs at Z can be obtained by skipping step H above, using the equations in steps I and J to adjust each acute value individually to Z, and then calculating the geometric mean of the adjusted values for each species individually. This alternative procedure allows an examination of the range of the adjusted acute values for each species.

K. Obtain the FAV at Z by using the procedure described in sections IV.J through IV.O of this Appendix.

L. If, for a commercially or recreationally important species the geometric mean of the acute values at Z from flow-through tests in which the concentrations of the test material were measured is lower than the FAV at Z, then the geometric mean must be used as the FAV instead of the FAV.

M. The Final Acute Equation is written as:

FAV = exp (V[ln(water quality char.)] + A – V[ln Z])

where:

V = pooled acute slope, and A = ln (FAV at Z).

Because V, A, and Z are known, the FAV can be calculated for any selected value of the water quality characteristic.

## VI. FINAL CHRONIC VALUE

A. There are two methods for calculating a Final Chronic Value (FCV). Selection of the appropriate methodology is dependent upon the availability of chronic toxicity data. If chronic toxicity data for the species described in section III.B.1 for freshwater species or section III.C.1 for saltwater species are available, the FCV can be calculated in the same manner as the FAV. Otherwise, the FCV can be calculated by dividing the FAV by the Final Acute-Chronic Ratio (FACR). The data requirements for calculating the FACR are identified in sections III.B.2 and III.C.2 for freshwater and saltwater species respectively. In some cases, it might not be possible to calculate a FCV. The FCV is (a) a calculated estimate of the concentration of a test material such that 95 percent of the genera (with which acceptable chronic toxicity tests have been conducted on the material) have higher GMCVs or (b) the quotient of an FAV divided by an appropriate ACR, or (c) the SMCV of a commercially or recreationally important species, if the SMCV is lower than the calculated estimate or the quotient, whichever is applicable.

*Note:* As the name implies, the ACR is a way of relating acute and chronic toxicities.

B. A chronic standard or guidance value shall be based on results of flow-through (except renewal is acceptable for daphnids) chronic tests in which the concentrations of test material in the test solutions were properly measured at appropriate times during the test. A chronic test is a comparative study in which organisms, that are subjected to different treatments, are observed for a long period or a substantial portion of their life span.

C. Results of chronic tests in which survival, growth, or reproduction in the control treatment was unacceptably low shall not be used. The limits of acceptability will depend on the species.

D. Results of chronic tests conducted in unusual dilution water, *e.g.,* dilution water in which total organic carbon or particulate matter exceeded five mg/L, should not be used, unless a relationship is developed between chronic toxicity and organic carbon or particulate matter, or unless data show that organic carbon, particulate matter, etc., do not affect toxicity.

E. Chronic values must be based on endpoints and lengths of exposure appropriate to the species. Therefore, only results of the following kinds of chronic toxicity tests shall be used:

1. Life-cycle toxicity tests consisting of exposures of each of two or more groups of individuals of a species to a different concentration of the test material throughout a life cycle. To ensure that all life stages and life processes are exposed, tests with fish should begin with embryos or newly hatched young less than 48 hours old, continue through maturation and reproduction, and should end not less than 24 days (90 days for salmonids) after the hatching of the next generation. Tests with daphnids should begin with young less than 24 hours old and last for not less than 21 days, and for ceriodaphnids not less than seven days. Tests with mysids should begin with young less than 24 hours old and continue until seven days past the median time of first brood release in the controls. For fish, data should be obtained and analyzed on survival and growth of adults and young, maturation of males and females, eggs spawned per female, embryo viability (salmonids only), and hatchability. For daphnids, data should be obtained and analyzed on survival and young per female. For mysids, data should be obtained and analyzed on survival, growth, and young per female.

2. Partial life-cycle toxicity tests consist of exposures of each of two more groups of individuals of a species of fish to a different concentration of the test material through most portions of a life cycle. Partial life-cycle tests are allowed with fish species that require more than a year to reach sexual maturity, so that all major life stages can be exposed to the test material in less than 15 months. A life-cycle test is a comparative study in which organisms, that are subjected to different treatments, are observed at least from a life stage in one generation to the same life-stage in the next generation. Exposure to the test material should begin with immature juveniles at least two months prior to active gonad development, continue through maturation and reproduction, and end not less than 24 days (90 days for salmonids) after the hatching of the next generation. Data should be obtained and analyzed on survival and growth of adults and young, maturation of males and females, eggs spawned per female, embryo viability (salmonids only), and hatchability.

3. Early life-stage toxicity tests consisting of 28- to 32-day (60 days post hatch for salmonids) exposures of the early life stages of a species of fish from shortly after fertilization through embryonic, larval, and early juvenile development. Data should be obtained and analyzed on survival and growth.

   *Note:* Results of an early life-stage test are used as predictions of results of life-cycle and partial life-cycle tests with the same species. Therefore, when results of a life-cycle or partial life-cycle test are available, results of an early life-stage test with the same species should not be used. Also, results of early life-stage tests in which the incidence of mortalities or abnormalities increased substantially near the end of the test shall not be used because the results of such tests are possibly not good predictions of comparable life-cycle or partial life-cycle tests.

F. A chronic value may be obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test or by analyzing chronic data using regression analysis.

1. A lower chronic limit is the highest tested concentration:

   a. In an acceptable chronic test;

   b. Which did not cause an unacceptable amount of adverse effect on any of the specified biological measurements; and

   c. Below which no tested concentration caused an unacceptable effect.

2. An upper chronic limit is the lowest tested concentration:

   a. In an acceptable chronic test;

   b. Which did cause an unacceptable amount of adverse effect on one or more of the specified biological measurements; and,

   c. Above which all tested concentrations also caused such an effect.

*Note:* Because various authors have used a variety of terms and definitions to interpret and report results of chronic tests, reported results should be reviewed carefully. The amount of effect that is considered unacceptable is often based on a statistical hypothesis test, but might also be defined in terms of a specified percent reduction from the controls. A small percent reduction (*e.g.,* three percent) might be considered acceptable even if it is statistically significantly different from the control, whereas a large percent reduction (*e.g.,* 30 percent) might be considered unacceptable even if it is not statistically significant.

G. If the chronic toxicity of the material to aquatic animals has been shown to be related to a water quality characteristic such as hardness or particulate matter for freshwater animals, refer to section VII of this Appendix.

H. If chronic values are available for the species in eight families as described in section III.B.1 or section III.C.1 of this Appendix, respective SMCVs shall be calculated for each species for which at least one chronic value is available by calculating the geometric mean of the results of all acceptable life-cycle and partial life-cycle toxicity tests with the species; for a species of fish for which no such result is available, the SMCV is the geometric mean of all acceptable early life-stage tests. Appropriate GMCVs shall also be calculated. A GMCV is the geometric mean of the SMCVs for the genus. The FCV shall be obtained using the procedure described in sections IV.J through IV.O of this Appendix, substituting SMCV and GMCV for SMAV and GMAV respectively. See section VI.M of this Appendix.

*Note:* Section VI.I through VI.L are for use when chronic values are not available for freshwater species in eight taxonomic families as described in section III.B.1 of this Appendix, or for saltwater species in eight taxonomic families as described in section III.C.1 of this Appendix.

I. For each chronic value for which at least one corresponding appropriate acute value is available, calculate an ACR, using for the numerator the geometric mean of the results of all acceptable flow-through (except static is acceptable for daphnids and midges) acute tests in the same dilution water in which the concentrations are measured. For fish, the acute test(s) should be conducted with juveniles. The acute test(s) should be part of the same study as the chronic test. If acute tests were not conducted as part of the same study, but were conducted as part of a different study in the same laboratory and dilution water, then they may be used. If no such acute tests are available, results of acute tests conducted in the same dilution water in a different laboratory may be used. If no such acute tests are available, an ACR shall not be calculated.

J. For each species, calculate the SMACR as the geometric mean of all ACRs available for that species. If the minimum ACR data requirements for calculation of a freshwater chronic standard or guidance value (as described in section III.B.2 of this Appendix are not met with freshwater data alone, saltwater data may be used along with the freshwater data. Conversely, if the minimum ACR data requirements for calculation of a saltwater chronic standard or guidance value (as described in section III.C.2 of this Appendix) are not met with saltwater data alone, freshwater data may be used along with the saltwater data.

K. For some materials, the ACR seems to be the same for all species, but for other materials the ratio seems to increase or decrease as the SMAV increases. Thus the FACR can be obtained in three ways, depending on the data available:

1. If the species mean ACR seems to increase or decrease as the SMAVs increase, the FACR shall be calculated as the geometric mean of the ACRs for species whose SMAVs are close to the FAV.

2. If no major trend is apparent and the ACRs for all species are within a factor of ten, the FACR shall be calculated as the geometric mean of all of the SMACRs.

3. If the most appropriate SMACRs are less than 2.0, and especially if they are less than 1.0, acclimation has probably occurred during the chronic test. In this situation, because continuous exposure and acclimation cannot be assured to provide adequate protection in field situations, the FACR should be assumed to be two, so that the FCV is equal to the Aquatic (Acute) value A(A). (See section X.B of this Appendix.) If the available SMACRs do not fit one of these cases, a FACR may not be obtained and a Tier I FCV probably cannot be calculated.

L. Calculate the FCV by dividing the FAV by the FACR.

FCV = FAV ÷ FACR

If there is a Final Acute Equation rather than a FAV, see also section V of this Appendix.

M. If the SMCV of a commercially or recreationally important species is lower than the calculated FCV, then that SMCV must be used as the FCV instead of the calculated FCV.

N. See section VIII of this Appendix.

## VII. FINAL CHRONIC EQUATION

A. A Final Chronic Equation can be derived in two ways. The procedure described in section VII.A of this Appendix will result in the chronic slope being the same as the acute slope. The procedure described in sections VII.B through N of this Appendix will usually result in the chronic slope being different from the acute slope.

1. If ACRs are available for enough species at enough values of the water quality characteristic to indicate that the ACR appears to be the same for all species and appears to be independent of the water quality characteristic, calculate the FACR as the geometric mean of the available SMACRs.

2. Calculate the FCV at the selected value Z of the water quality characteristic by dividing the FAV at Z (see section V.M of this Appendix) by the FACR.

3. Use V = pooled acute slope (see section V.M of this Appendix), and L = pooled chronic slope.

4. See section VII.M of this Appendix.

B. When enough data are available to show that chronic toxicity to at least one species is related to a water quality characteristic, the relationship should be taken into account as described in sections C through G below or using analysis of covariance. The two methods are equivalent and produce identical results. The manual method described below provides an understanding of this application of covariance analysis, but computerized versions of covariance analysis are much more convenient for analyzing large data sets. If two or more factors affect toxicity, multiple regression analysis shall be used.

C. For each species for which comparable chronic toxicity values are available at two or more different values of the water quality characteristic, perform a least squares regression of the chronic toxicity values on the corresponding values of the water quality characteristic to obtain the slope and its 95 percent confidence limits for each species.

*Note:* Because the best documented relationship is that between hardness and acute toxicity of metals in fresh water and a log-log relationship fits these data, geometric means and natural logarithms of both toxicity and water quality are used in the rest of this section. For relationships based on other water quality characteristics, such as pH, temperature, no transformation or a different transformation might fit the data better, and appropriate changes will be necessary throughout this section. It is probably preferable, but not necessary, to use the same transformation that was used with the acute values in section V of this Appendix.

D. Decide whether the data for each species are relevant, taking into account the range and number of the tested values of the water quality characteristic and the degree of agreement within and between species. For example, a slope based on six data points might be of limited value if it is based only on data for a very narrow range of values of the water quality characteristic. A slope based on only two data points, however, might be more useful if it is consistent with other information and if the two points cover a broad range of the water quality characteristic. In addition, chronic values that appear to be questionable in comparison with other acute and chronic data available for the same species and for other species in the same genus in most cases should not be used. For example, if after adjustment for the water quality characteristic, the chronic values available for a species or genus differ by more than a factor of 10, rejection of some or all of the values is, in most cases, absent countervailing circumstances, appropriate. If a useful chronic slope is not available for at least one species or if the available slopes are too dissimilar or if too few data are available to adequately define the relationship between chronic toxicity and the water quality characteristic, it might be appropriate to assume that the chronic slope is the same as the acute slope, which is equivalent to assuming that the ACR is independent of the water quality characteristic. Alternatively, return to section VI.H of this Appendix, using the results of tests conducted under conditions and in waters similar to those commonly used for toxicity tests with the species.

E. Individually for each species, calculate the geometric mean of the available chronic values and then divide each chronic value for a species by the mean for the species. This normalizes the chronic values so that the geometric mean of the normalized values for each species individually, and for any combination of species, is 1.0.

F. Similarly, normalize the values of the water quality characteristic for each species individually.

G. Individually for each species, perform a least squares regression of the normalized chronic toxicity values on the corresponding normalized values of the water quality characteristic. The resulting slopes and the 95 percent confidence limits will be identical to those obtained in section VII.B of this Appendix. Now, however, if the data are actually plotted, the line of best fit for each individual species will go through the point 1,1 in the center of the graph.

H. Treat all of the normalized data as if they were all the same species and perform a least squares regression of all of the normalized chronic values on the corresponding normalized values of the water quality characteristic to obtain the pooled chronic slope, L, and its 95 percent confidence limits.

If all normalized data are actually plotted, the line of best fit will go through the point 1,1 in the center of the graph.

I. For each species, calculate the geometric mean, M, of the toxicity values and the geometric mean, P, of the values of the water quality characteristic. (These are calculated in sections VII.E and F of this Appendix.)

J. For each species, calculate the logarithm, Q, of the SMCV at a selected value, Z, of the water quality characteristic using the equation:

$$Q = \ln M - L(\ln P - \ln Z)$$

*Note:* Although it is not necessary, it is recommended that the same value of the water quality characteristic be used here as was used in section V of this Appendix.

K. For each species, calculate a SMCV at Z using the equation:

$$SMCV = \exp(Q)$$

*Note:* Alternatively, the SMCV at Z can be obtained by skipping section VII.J of this Appendix, using the equations in sections VII.J and K of this Appendix to adjust each chronic value individually to Z, and then calculating the geometric means of the adjusted values for each species individually. This alternative procedure allows an examination of the range of the adjusted chronic values for each species.

L. Obtain the FCV at Z by using the procedure described in sections IV.J through O of this Appendix.

M. If the SMCV at Z of a commercially or recreationally important species is lower than the calculated FCV at Z, then that SMCV shall be used as the FCV at Z instead of the calculated FCV.

N. The Final Chronic Equation is written as:

FCV = exp (L[ln(water quality characteristic)] + lnS – L[lnZ])

where:

L = pooled chronic slope and S = FCV at Z.

Because L, S, and Z are known, the FCV can be calculated for any selected value of the water quality characteristic.

## VIII. FINAL PLANT VALUE

A. A Final Plant Value (FPV) is the lowest plant value that was obtained with an important aquatic plant species in an acceptable toxicity test for which the concentrations of the test material were measured and the adverse effect was biologically important. Appropriate measures of the toxicity of the material to aquatic plants are used to compare the relative sensitivities of aquatic plants and animals. Although procedures for conducting and interpreting the results of toxicity tests with plants are not well-developed, results of tests with plants usually indicate that criteria which adequately protect aquatic animals and their uses will, in most cases, also protect aquatic plants and their uses.

B. A plant value is the result of a 96-hour test conducted with an alga or a chronic test conducted with an aquatic vascular plant.

*Note:* A test of the toxicity of a metal to a plant shall not be used if the medium contained an excessive amount of a complexing agent, such as EDTA, that might affect the toxicity of the metal. Concentrations of EDTA above 200 ug/L should be considered excessive.

C. The FPV shall be obtained by selecting the lowest result from a test with an important aquatic plant species in which the concentrations of test material are measured and the endpoint is biologically important.

## IX. OTHER DATA

Pertinent information that could not be used in earlier sections might be available concerning adverse effects on aquatic organisms. The most important of these are data on cumulative and delayed toxicity, reduction in survival, growth, or reproduction, or any other adverse effect that has been shown to be biologically important. Delayed toxicity is an adverse effect to an organism that results from, and occurs after the end of, its exposure to one or more test materials. Especially important are data for species for which no other data are available. Data from behavioral, biochemical, physiological, microcosm, and field studies might also be available. Data might be available from tests conducted in unusual dilution water (see sections IV.D and VI.D of this Appendix), from chronic tests in which the concentrations were not measured (see section VI.B of this Appendix), from tests with previously exposed organisms, and from tests on formulated mixtures or emulsifiable concentrates. Such data might affect a criterion if the data were obtained with a commercially or recreationally important species, the test concentrations were measured, and the endpoint was biologically important.

## X. STANDARDS AND GUIDANCE VALUES, TIER I

A. Standards or guidance values to protect aquatic life include: the Aquatic (Acute) or A(A) and the Aquatic (Chronic) or A(C).

B. The A(A) is equal to one-half the FAV. The A(A) is an estimate of the highest concentration of a material in the water column to which an aquatic community can be exposed briefly without resulting in an unacceptable effect.

C. The A(C) is equal to the lowest of the FCV or the FPV (if available) unless other data (see section IX of this Appendix) show that a lower value should be used. The A(C) is an estimate of the highest concentration of a material in the water column to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. If toxicity is related to a water quality characteristic, the A(C) is obtained from the Final Chronic Equation or FPV (if available) that results in the lowest concentrations in the usual range of the water quality characteristic, unless other data (see section IX) show that a lower value should be used.

D. Round both the A(A) and the A(C) to two significant digits.

## XI. FINAL REVIEW

A. The derivation of the standard or guidance value should be carefully reviewed by rechecking each step of the guidance in this part. Items that should be especially checked are:

1. If unpublished data are used, are they well documented?

2. Are all required data available?

3. Is the range of acute values for any species greater than a factor of 10?

4. Is the range of SMAVs for any genus greater than a factor of 10?

5. Is there more than a factor of 10 difference between the four lowest GMAVs?

6. Are any of the lowest GMAVs questionable?

7. Is the FAV reasonable in comparison with the SMAVs and GMAVs?

8. For any commercially or recreationally important species, is the geometric mean of the acute values from flow-through tests in which the concentrations of test material were measured lower than the FAV?

9. Are any of the chronic values used questionable?

10. Are any chronic values available for acutely sensitive species?

11. Is the range of acute-chronic ratios greater than a factor of 10?

12. Is the FCV reasonable in comparison with the available acute and chronic data?

13. Is the measured or predicted chronic value for any commercially or recreationally important species below the FCV?

14. Are any of the other data important?

15. Do any data look like they might be outliers?

16. Are there any deviations from the guidance in this part? Are they acceptable?

B. On the basis of all available pertinent laboratory and field information, determine if the standard or guidance value is consistent with sound scientific evidence. If it is not, another standard or guidance value, either higher or lower, shall be derived consistent with the guidance in this part.

**Procedures for Deriving Aquatic Life Tier II Standards and Guidance Values, Sections XII-XVII**

## XII. SECONDARY ACUTE VALUE

If all eight minimum data requirements for calculating an FAV using Tier I are not met, a Secondary Acute Value (SAV) shall be calculated for a chemical as follows:

To calculate a SAV, the lowest GMAV in the database is divided by the Secondary Acute Factor (SAF) (Table 1 of this Appendix) corresponding to the number of satisfied minimum data requirements listed in the Tier I methodology (section III.B.1 of this Appendix for freshwater species and section III.C.1 for saltwater species). Data requirements contained in sections I, II, and IV shall be applied to calculation of a SAV. If all eight minimum data requirements are satisfied, a Tier I value calculation may be possible. In order to calculate a freshwater SAV, the database must contain, at a minimum, a genus mean acute value (GMAV) for one of the following three genera in the family Daphnidae - *Ceriodaphnia sp., Daphnia sp.,* or *Simocephalus sp.* In order to calculate a saltwater SAV, it would be desirable if the database contained, at a minimum: a genus mean acute value (GMAV) for a species or genus in one of the following families - Mysidae or Penaeidae; and a GMAV for a saltwater fish.

If appropriate, the SAV shall be made a function of a water quality characteristic in a manner similar to that described in Tier I.

**Table 1. Secondary Acute Factors**

| *Number of minimum data requirements satisfied* | *Secondary Acute Factor* |
|---|---|
| 1 | 21.9 |
| 2 | 13.0 |
| 3 | 8.0 |
| 4 | 7.0 |
| 5 | 6.1 |
| 6 | 5.2 |
| 7 | 4.3 |

## XIII. SECONDARY ACUTE-CHRONIC RATIO

If three or more experimentally determined ACRs, meeting the data collection and review requirements of section VI of this Appendix, are available for the chemical, determine the FACR using the procedure described in section VI. If fewer than three acceptable experimentally determined ACRs are available, use enough assumed ACRs of 18 so that the total number of ACRs equals three. Calculate the Secondary Acute-Chronic Ratio (SACR) as the geometric mean of the three ACRs. Thus, if no experimentally determined ACRs are available, the SACR is 18.

## XIV. SECONDARY CHRONIC VALUE

Calculate the Secondary Chronic Value (SCV) using one of the following:

A. SCV = FAV ÷ SACR (use FAV from Tier I)

B. SCV = SAV ÷ FACR

C. SCV = SAV ÷ SACR

If appropriate, the SCV will be made a function of a water quality characteristic in a manner similar to that described in Tier I.

## XV. COMMERCIALLY OR RECREATIONALLY IMPORTANT SPECIES

If for a commercially or recreationally important species the geometric mean of the acute values or chronic values from flow-through tests in which the concentrations of the test materials were measured is lower than the calculated SAV or SCV, then that geometric mean must be used as the SAV or SCV instead of the calculated SAV or SCV.

## XVI. STANDARDS AND GUIDANCE VALUES, TIER II

A. Standards or guidance values to protect aquatic life shall include: the Aquatic (Acute) or A(A) value and the Aquatic (Chronic) or A(C) value.

B. The A(A) is equal to one-half of the SAV.

C. The A(C) is equal to the lowest of the SCV or the Final Plant Value, if available, unless other data (see section IX of this Appendix) show that a lower value should be used.

If toxicity is related to a water quality characteristic, the A(C) is obtained from the Secondary Chronic Equation or FPV, if available, that results in the lowest concentrations in the usual range of the water quality characteristic, unless other data (see section IX of this Appendix) show that a lower value should be used.

D. Round both the A(A) and the A(C) to two significant digits.

## XVII. APPROPRIATE MODIFICATIONS

On the basis of all available pertinent laboratory and field information, determine if the Tier II value is consistent with sound scientific evidence. If it is not, another value, either higher or lower, shall be derived consistent with the guidance in this Appendix.

**Historical Note**

Sec. filed Feb. 10, 1998 eff. 30 days after filing.

## § 706.2 Severability.

If any provision of this Part or its application to any person or circumstance is held to be invalid, the remainder of this Part and the application of that provision to other persons or circumstances will not be affected.

**Historical Note**

Sec. filed Feb. 10, 1998 eff. 30 days after filing.